The Portuguese footwear industry: a success story?

Andreia Sofia Silva Pacheco

120432012@fep.up.pt

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Supervisor:

Ester Gomes da Silva

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Abstract

In the current competitive environment, developed countries, and particularly those that possess a biased productive structure towards 'traditional' industries, are extremely vulnerable to the competitive pressure from the BRICs and East European countries. These economies possess lower absolute costs and also lower unit labour costs, making it impossible for higher wage countries to compete in price, which poses significant challenges to the firms whose production is located on the lower tail of product segments.

This study approaches the referred issues, focusing on an industry particularly vulnerable to the competitive pressure of emerging economies – the footwear industry – and on a developed country which presents a typical "stuck in the midle" situation, i.e., an economy with significantly higher per capita income levels and general standards of living than emergent countries, but which is still far from the most developed countries in a number of developmental and technological aspects. A rigorous account of the evolution of the Portuguese footwear sector is undertaken, focusing on its reaction to the new competitive environment and describing the observed movements in the value chain.

Our findings indicate that even though some upgrading evidence is found, namely regarding the computation of unit values, it is not as enthusiastic as it might sound. Upgrading features when relativized actually show Portugal's competitive position as nearly stagnated, very close to its 1995 performance. In fact, product innovation features evidence a downward trend, which is not consistent with industrial upgrading.

Keywords: International trade; Competitiveness; Industrial upgrading.

JEL classification: F14, F23

Index of Contents

Index of figures

Index of Tables

1. Introduction

Achieving international competitiveness has become a key issue to countries' growth prospects and standards of living (Hausmann *et al.*, 2007; Martin and Méjean, 2011). However, it can be built upon very different factors; countries compete in different segments and adapt themselves to challenges imposed by rivals' competition in distinct ways (Fontagné *et al.*, 2008). In other words, competitiveness can be based on the availability of abundant resources, like cheap labour or raw materials, or on the existence of specific factors, such as skilled labour and local specific knowledge (Sengenberger and Pyke, 1991; Costa, 2010). There is no "single recipe" to enable growth and the creation of more and better jobs, but in order to be competitive it is commonly argued that a country must be able to raise standards of living and employment, while maintaining a sustainable environment and balanced external trade accounts (Janger *et al.*, 2011).

Developed countries, and most notably countries that still possess a biased industry structure towards *traditional industrie*s, such as Portugal, are particularly vulnerable to the competitive pressure from the BRICs[2] and East European countries. These new competitors possess lower absolute costs and also lower unit labour costs, making it impossible for higher wage countries to compete in price. The consequence is, then, to explore competitive advantage through quality, supporting innovation and R&D in order to be one step ahead of rivals (Aiginger, 2000). Also, Emerging Economies offer the opportunnity of reorganizing production on a truly global scale. As a result, China and other Emerging Economies accelerated the erosion of developed economies' comparative advantage in labour-intensive production tasks (Timmer *et al.*, 2013).

It is clear that globalisation has profoundly altered the nature of competition by connecting economies and influencing the wellbeing of workers worldwide (Hatzichronoglou, 1996; Freeman, 2008). With markets being increasingly more interlinked, developed economies' weaknesses became more exposed. In a first stage, emergent economies competed mostly on low segments of the market, but nowadays countries like China or India are investing intensively in R&D, in order to move their

[2] The BRIC acronym refers to the most dynamic emerging economies of Brazil, Russia, India and China, which are characterized by being populous, having a fast economic growth, low income levels and large territory (Desai, 2013).

industries up in the value chain and leapfrog into the global economy (European Commission, 2010a). China's entry in the World Trade Organization, the European Union enlargement to the East and the strong appreciation of the euro against the dollar between 2002 and 2008 provoked an erosion in the price competitiveness of many competing European firms (Godinho *et al.*, 2014).

This study approaches the challenges faced by Portuguese firms in keeping up with their rivals and maintaining/increasing international competitiveness, focusing on a traditional exporting sector, the footwear industry. Traditionally seen as an industry whose competitive advantage stemmed from low production costs, this sector has recently been dubbed by the media as a "success case", in which firms were able to circumvent rising competition from abroad, by improving quality and promoting significant increases in value added (cf. Marques, 2010; APICCAPS, 2011). The available evidence of sectoral upgrading is, however, very scarce: it is generally based on a number of limited indicators on finance, production and trade, with a restricted focus on R&D and innovation (e.g., COFACE, 2007; APICCAPS, 2012; AdI, 2012).[3]

It is our purpose to contribute to a greater understanding of the evolution of the competitiveness of the sector, relating it to the challenges posed by the changing environment, adopting an industry-oriented approach and making a rigorous account of upgrading. We also aim at providing a comparative assessment of the Portuguese experience with other countries where this sector has an important exporting tradition, as it is the case of Italy, China (Hong Kong included) , Viet Nam, Indonesia, Belgium, Spain, Netherlands, Germany, Brazil, Romania, France, India, UK, Thailand, Austria, USA, Slovakia and Denmark. The investigation is carried out by using statistical measures on quality upgrading, namely by computing export unit values and its related measures, as well as other complementary upgrading and innovation metrics, such as patent, industrial designs and trademarks registration; productivity changes and capital and software investments.

The dissertation is structured as follows: Chapter 2 clarifies the concept of international competitiveness and provides a discussion of the theoretical underpinnings of the relationship between competitiveness, the composition of exports and the

[3] A few studies have been developed on the matter, but the approach adopted was essentially micro, focusing on the organization of labour, incremental innovation and on the re-design of the competitive structure firm-wise (Santos *et al.*, 2006; Moura e Sá and Abrunhosa, 2007).

determination of gains from trade. An analysis is also made of the role played by innovation as a source of competitiveness in the case of traditional industries, in the context of increasing globalization and fierce competition from emerging economies. Chapter 3 presents the methodology, identifying the available techniques of industrial upgrading, discussing their potentialities and limitations and describing the indicators selected in the study and the corresponding data sources. Chapter 4 is dedicated to the empirical examination of upgrading in the Portuguese footwear sector on the basis of the selected indicators. It starts with a broad characterization of recent trends in the footwear industry, covering production, trade and employment, analysing the Portuguese experience and comparing it with that of other major footwear exporting countries. It then proceeds with an analysis of indicators of industry upgrading, making a comparative assessment of product, process and functional upgrading/innovation. Chapter 5 concludes, providing a synthesis of results found and of the corresponding policy implications, critically reviewing the work that has been done and offering some guidelines for further improvements in future research.

2. Competitiveness and industrial upgrading: a literature review

2.1. Concepts of competitiveness, their history and interrelations

Competitiveness, the talent of competing with rivals (Gerni *et al.*, 2013), is a concept extensively used among economists, playing a central role in the discussions on trade patterns and growth prospects in countries worldwide (Hatzichronoglou, 1996; Siggel, 2006; Anca, 2012). [4]The meaning of "competitiveness" itself is, however, not unanimous among authors, and has inclusively been changing over time. Along with different historical and theoretical definitions of the term, there are also differences concerning its scope, level and measurement (Hatzichronoglou, 1996; Siggel, 2006; Balkytė and Tvaronavičienė, 2010; Anca, 2012).

A useful starting point to assessing the meaning of competitiveness stems from the analysis of worldwide definitions, such as those proposed by international organizations. OECD defines competitiveness as "the ability of firms, industries, regions, nations or supranational regions to generate, while being and remaining exposed to international competition, relatively high factor income and factor employment levels on a sustainable basis" (Hatzichronoglou, 1996, p.20). In a similar vein, the EU relates competitiveness to the accomplishment of high and rising standards of living, along with high and sustainable employment levels, while keeping intact the welfare prospects of future generations (Martin, 2004). The issue of sustainability is highlighted in recent reports (European Commission, 2010a, 2010b) , which refer the need to adopt "smart" and inclusive economic growth, and emphasize the necessity to focus on resource-efficiency and green technologies.

Both OECD and EU conceptions highlight aspects that are currently seen as central in the definition of competitiveness, namely its relationship with sustainability. This aspect was nevertheless neglected for a long time in the economic literature. In fact, only recently environment and social sustainability issues have become to be seen as important features of competitiveness (Balkytė and Tvaronavičienė, 2010).

A full understanding of the notion of competitiveness and its evolution over time requires, however, an appropriate theoretical frame. Looking to the evolution of the concept (wether directly expressed or implicitly taken) from the earlier theoretical

[4] Some authors argue that it has been "overused" (Anca, 2012);

writings to the more recent developments, it becomes evident that every school of thought has a particular view on competitiveness and the way it is achieved.

In the early beginnings of economic thought, that is, with classical scholars, like Adam Smith (1776) and David Ricardo (1817), the notion of competitiveness was essentially related to differences in production costs.[5] Smith introduced the notion of absolute advantage, in which each country would export the goods in which it had lower production costs. This notion would then be refined by David Ricardo (1817) under the formulation of comparative advantage: each country exports the goods in which it has lower opportunity costs. Both of these seminal contributions influenced significantly the current understanding of the term. In fact, the international divison of labour and productive specialization are partly based on differences in productivity stemming from the use of different technologies (Anca, 2012).

The use of comparative advantage as a source of competitiveness was also made by Eli Heckscher and Bertil Ohlin (1933), in the well-known neoclassical trade model. The authors relate it, however, to a different source –factor endowments –meaning that countries' specializations are ultimately determined by differences in factor proportions (Heckscher and Ohlin, [1991] (1933); Leamer, 1995; Anderson, 2008; Stout, 2008; Anca, 2012). Some authors argue that only the Ricardian and Heckscher-Ohlin models embody the concept of comparative advantage perfectly (cf., Siggel, 2006), whereas others state that Heckscher-Ohlin theory remains the most important theorization about international competitive advantage (Stout, 2008). Nonetheless, there remains a broader interpretation of comparative advantage that suggests that it will take place whenever equilibrium factor prices are lower than those of international competitors, regardless the sources of the cost advantage (Siggel, 2006).

More recently, the economic literature has been relating the notion of competitiveness to factors other than cost advantage. Krugman's (1980) well-known model of international trade introduces product differentiation as a source of trade, along with cost reduction benefits from the exploitation of scale economies. At the same time, other authors have documented the relevance of factors related to innovation, product

[5] Even though comparative advantage and competitiveness are seen as synonyms in these models, nowadays competitiveness is taken as a broader concept, encompassing features other than cost. Over time, the comparative advantage concept evolved and its wider meaning is usually denominated as competitive advantage (Stout, 2008).

upgrading and marketing as possible sources of trade (e.g., Vernon, 1966; Porter, 1990; Grossman and Helpman, 1991; Melitz, 2003).

Grossman and Helpman (1991), for instance, extend Krugman's monopolistic competition model considering endogenous technological change. They basically bring a new feature to the discussion, adding that an advantage exists within a cyclical process where each new product enjoys a limited run at the technological frontier, only to fade when better products come along. Almost every product exists on a quality ladder, with variants below, that may already have become obsolete, and others above, that have yet to be discovered (Grossman and Helpman, 1991).

Melitz (2003), on the other hand, considers productivity as the main criterion to export: more productive firms will more likely be successful in the export market whereas the least productive will be forced to exit (Melitz, 2003). More recently, Baldwin and Harrigan (2011) developed a refined version of Melitz' model, in which firms' competitiveness depends upon their quality-adjusted prices. The most competitive varieties, according to them, are high price/high-quality ones: higher quality goods are more costly, more profitable, and expected to penetrate distant markets successfully (Baldwin and Harrigan, 2011).

These theoretical developments led to the emergence of new conceptualizations of competitiveness that are underpinned by factors other than price competition, such as human resources, institutional quality, human capital and the ability to develop technical knowledge (Aiginger, 2000; Cortright, 2001; Gerni *et al.*, 2013). Business performance related to productivity, prices and labour costs is still relevant, but nowadays the relationship between competitiveness and wellbeing is becoming stronger and mutually supportive (Balkytė and Tvaronavičienė, 2010).

Competitiveness has certainly evolved as an historical concept, however, the discussion concerning competitiveness goes beyond the debate about its different sources. A related matter that has also generated some controversy in the literature refers to the appropriate scope of application. In particular, the notion of "national competitiveness", implied when referring to the national stages of competitiveness (and the related idea of "competing countries") has recently received strong criticism (Aiginger, 2006; Balkytė and Tvaronavičienė, 2010). Traditionally, most definitions of the term took the country as an appropriate level of analysis (Siggel, 2006). Competitiveness was thus seen as the way a nation could achieve prosperity (Cismas *et al.*, 2011), referring also to the set of

factors, policies and institutions that determined the current level of productivity of a country (Imbrescu and Băbăită cit in Cismas, *et al.*, 2011). Under such perspective, a country would have to find its own competitiveness level and establish its position, finding opportunities to win its share in the global market (Lapinskienė and Tvaronavičienė, 2009).

The existing rankings of competitiveness adopt this approach, by calculating broad figures of national competitiveness (e.g., IMD World Competitiveness Yearbook, The World Competitiveness Report). The problems associated with this categorization are manifold: the "bold" classification obscures the specific factors responsible for a particular competitive position; countries with quite different factor levels can reach the same index of general competitiveness; the methodology itself is rather ambiguous,[6] and, finally, the use of attributes such as the stability of government, the quality of institutions and the existence of profitable investment opportunities seems to be related more to the assessment of the business climate, rather than reflecting competitiveness (Siggel, 2006).

On the other hand, the concept of competitiveness at the firm level is quite consensual and easier to define. It is usually seen as the ability to produce the "right" goods and services of the "right" quality, at the "right" price, at the "right" time, meeting customers' needs more efficiently and more effectively than other firms (Aiginger, 2006). In other words, at this level, competitiveness resides in the ability of firms to consistently and profitably produce goods that meet the requirements of an open market in terms of price and quality (Martin, 2004). It is also seen, somehow, as opposed to national competitiveness because, while for a nation the aim is to maintain and improve its citizens' living standards, for a firm the objective is to deal successfully with international competition by making profits and increasing market share (Hatzichronoglou, 1996).

Along with national and firm scopes of competitiveness, there is also the notion of industry competitiveness, which is used in this study. This notion is partly related to Porter's analytical construction of clusters and its relationship with competitive advantage (Porter, 2002; Stejskal and Hajek, 2012). Industrial competitiveness implies both static and dynamic features, related to the firm performance, potential (opportunities) and management processes, which are directly associated with the capacity to adapt to exogenous change (Siggel, 2006). For an industrial sector, the main competitiveness

[6] See Rutkauskas (2008) for more detail on this issue.

criterion is maintaining and improving its position in the global market (Balkytė and Tvaronavičienė, 2010), being capable of generating employment and income (Gerni *et al.*, 2013). Simultaneously, a competitive industry must have the ability to supply increasing aggregate demand and sustain exports' growth, whereas a loss of competitiveness is usually marked by the deterioration of the trade account (Black *et al.*, *cit in* Balkytė and Tvaronavičienė, 2010).

Considering both the evolution of the theoretical background and scope of competitiveness, we come to the conclusion that classical and neoclassical theorists (Heckscher and Ohlin, [1991] (1933; Ricardo, ([2001] (1817); Smith, ([2005] (1776)) focus on competitiveness only at the country level, without even questioning another possible scope. With the evolution of economic theory and the challenges posed by the spread of globalization, competitiveness not only encompasses new features, such as sustainability and raising standards of living (Hatzichronoglou, 1996; Balkytė and Tvaronavičienė, 2010), but it has also narrowed down the different scopes of appliance to local/regional, industrial and firm levels (Hatzichronoglou, 1996; Siggel, 2006; Balkytė and Tvaronavičienė, 2010; Anca, 2012).

Table 1 summarizes the main features of competitiveness according to the different schools of thought surveyed.[7]

[7] Figure A.1. in annex provides a more graphic and explicit view on this evolution, presenting also the relationship between scope and type of competition.

Table 1: Overview on competitiveness

Theoretical background		Main Author(s)	Scope	Reasons for trade/ key assumptions	Competition
Classical Theory	Absolute advantage	Adam Smith	National	Absolute differences in productivity	Price competition
	Comparative advantage	David Ricardo	National	Relative differences in productivity, stemming from technology	Price competition
Neoclassical Theory		Heckscher-Ohlin	National	Different factor endowments	Price competition
New Trade Theory		Krugman	Firm	Diversity	Quality competition
		Melitz	Firm /industry level	• Productivity growth • Heterogeneity • Markups	Price/quality competition
Product's Life Cycle		Vernon	Firm	• Innovation • Scale Economies	Quality competition
Agglomeration Theory		Porter	Regional	• Externalities • Sophistication of local competition • Innovative capacity	Price Quality/competition

2.2. Sources of competitiveness and gains from trade

From the discussion above, it becomes clear the distinction between cost and quality-based competitiveness. The former is inherently related to the production of a good at a relatively lower cost. When price is the sole element for comparison, as it is the case of homogeneous goods, competitive advantage is generally accomplished through the use of low-skilled labour, low technology intensity and poorly qualified abundant resources (Cismas *et al.*, 2011).

Maintaining a competitive position based on price competition is, however, difficult, for even countries mainly specialized in traditional industries have to provide high product quality or high R&D intensity to sustain their competitiveness levels (Janger *et al.*, 2011). Furthermore, there are plenty of risks associated with an excessive focus on price competitiveness related, for instance, with possible currency depreciation (Stout, 2008) or to the potential deterioration of working and standard of living conditions (Goto and Endo, 2013).

The need to move beyond factor-driven competitiveness is acknowledged by several authors, who stress the role played by the complementary side of competition: quality (e.g., Sengenberger and Pyke,1991; Fontagné *et al.*, 2008). Quality competition occurs within a competitive environment in which upgrading quality and the increase in the willingness to pay are important relative to competing at low prices. "Climbing up the quality ladder" means creating a product worth paying more for, due to measurable features, like speed, capacity, size, durability and product differentiation; or intangible ones, like reliability, advertising, design, goodwill and trust. Quality may even arise simply through flexibility in use, compatibility, information or maintenance contracts (Aiginger, 2000; Stout, 2008). It is also related to high and increasing quality of research, education, organisational learning and management (Lundvall and Lorenz, 2009). It is generally assumed that quality upgrading leads to supranomal profits, through the intensive utilization of skilled labour, more sophisticated inputs, communication technology and knowledge (Aiginger, 2006).

Taking into account the different impact of price and quality competitition over general welfare, the World Economic Forum (Schwab, 2013) has recently provided a list of distinct "stages" of competitiveness. According to this list, factor driven cost competititon is the first stage. Firms compete on the basis of price and sell raw products

or commodities, with low productivity levels being reflected in low wages (Schwab, 2013). In contrast, quality prevails in both the second and third stages of competitiveness: the second one is efficiency-driven (more efficient production, better quality products); and the last one is innovation-driven (new products from innovative, complex production processes; creation of new processes) (Cismas *et al*., 2011).

Changes from the first to the second competitiveness stage occur through productivity increases: when a country reaches sufficiently high productivity levels, wages will rise, allowing the movement from factor-driven to efficiency-driven competitiveness. The country begins to develop more efficient production processes and increases product quality. Finally, as countries move into the innovation-driven stage, wages will have risen by so much that a country is able to sustain higher wages and the associated standards of living only if new and unique products are developed: companies must compete by producing new and differentiated goods using the most sophisticated production processes (Cismas *et al*., 2011; Schwab, 2013).

In operational terms, the inclusion of a particular country in one of these stages is performed by calculating an index based on 12 pillars of competitiveness, including the so-called assessment of "basic requirements" (institutions, infrastructure, macroeconomic environment and health and primary education), "efficiency enhancers" (higher education and training, labour and product market efficiency, financial market development, technological readiness and market size) and, at last, innovation and sophistication factors. The final outcome reflects the overall performance of the country's institutions, policies and productivity levels. It gives some indication of general performance, although it does not say much about micro or sectoral competitive environment (Schwab, 2013).

Even though the use of a classification scheme as this has a number of drawbacks, the general message underlying such computation is that it is not indifferent to build competitiveness on any factor: different stages of competitiveness lead to distinct effects on sustainability and economic growth. More precisely, efficiency and mainly innovation-driven competitiveness are generally perceived as more growth-enhancing then factor-driven competitiveness (Cismas *et al*., 2011).

In fact, a broad consensus has emerged around the notion that economic growth is broadly sustained by efficiency gains, innovation and quality upgrading. It is thus essential for every country to become strategically competitive and achieve sustainability.

Efficiency gains are important not only for competitiveness at the firm, sector and national levels, but also for facilitating the movement of labour and capital to new and growing sectors. Improving the quality and volume of goods and services facilitates a virtuous circle of increases in production, income, and demand that drives overall economic growth. As companies increase productivity, they generate economic value that can increase both wages and profits (Manyika *et al.,* 2011).

Related to efficiency and productivity gains is "upgrading", a key concept in the global value chain (GVC) literature (cf. Goto and Endo, 2013), related to product, process and functional improvement. Four upgrading categories are generally considered (e.g., Ponte and Ewert, 2009), but in this study we will only consider three, since our focus is on a single industry[8]: (1) *product upgrading*: moving into more sophisticated products with increased unit value; (2) *process upgrading*: achieving a more efficient transformation of inputs into outputs through the reorganization of productive activities; (3) *functional upgrading*: acquiring new functions (or abandoning old ones) that increase the skill content of activities (Ponte and Ewert, 2009).

The importance of upgrading, intrinsic to this discussion, acquires a crucial relevance for a country, since it plays a central role in raising standards of living (Grossman and Helpman, 1991). Amiti and Khandelwal (2013) extend a bit further this argument, claiming that the production of high-quality goods is a pre-condition for export success and, ultimately, for economic development (Amiti and Khandelwal, 2013). Similarly, Kwaramba (2013) suggests that product quality is one of the key determinants for exports' success and thus for a country's economic development (Grossman and Helpman, 1991; Kwaramba, 2013). Alongside with upgrading, innovation (more precisely, quality improving innovation) seems to have a relevant effect on growth and welfare (Grossman and Helpman, 1991; Aghion and Howitt, 2004). The accomplishment of such upgrading goes hand in hand with the accumulation of human capital, since this factor is a key component to technology change and product quality upgrading (Cohen and Levinthal, 1989). Furthermore, upgrading can also be seen as the only long-run viable option for a country. In many cases, failure to upgrade will leave no option but to continually search for low-cost labour, which will probably lead to a relocation of production sites. Alternatively, it is possible to "go informal", which entails informal

[8] The fourth upgrading category is inter-sectoral upgrading which applies competences acquired in one function of a chain and uses them in distinct sectors or chains (Ponte and Ewert, 2009).

employment arrangements. It is clear that this kind of "race to the bottom" strategy will not be viable in the long run (Goto and Endo, 2013).

Complementarily, and revisiting the importance of global/international value chains, most of the times fragmentation is implicit as a strategy for upgrading: competitiveness is no longer solely determined by domestic clusters of manufacturing firms, but it also relies increasingly on the successful integration of other distinct tasks in international value chains, in order to build the so-called competitive advantage and add value (Timmer *et al.*, 2013). Several studies suggest positive and significant technological transfer for upgrading in both processes and products from foreign buyers through GVCs to local suppliers (Schmitz and Knorringa 2000). Also, there seems to be a logical evolution among the three upgrading types: when labour costs increase to the extent that upgrading in process or products becomes difficult, more knowledge-intensive functions are required and that is when functional upgrading starts to be developed (Goto and Endo, 2013).

Furthermore, the upgrading strategy is consistent with the concept of agglomeration, which is equally pertinent for the building process of strategic competitiveness: agglomerations emerge vigorously as sites of positive externalities and competitive advantages; at the same time, they function as spatial anchors of a series of international trading flows, which are critical to the competitive success of manufacturing industries (Scott, 2006).

All of these concepts are deeply intertwined, converging into the figure of international value chains and depending on the success or failure of innovation. Successful Innovation should in principle help increase real wages and general welfare, but the final outcome of innovation is not so clear-cut. Generally, product-innovation leads to positive effects on employment, wages and value added, whereas process-innovation may in some cases unleash predator price competition (Reinert, 2006). So, even though focusing on innovation as the basic engine of economic growth should not be problematic, it may in some cases generate perverse effects on social cohesion. Along with innovation, upgrading, when evolved in a global value chain, can actually entail product downgrading and this could be a "better deal" as a short-term solution, but it is unlikely to be a profitable strategy in the long-run (Ponte and Ewert, 2009).

2.3. Innovation as a source of competitiveness in traditional industries

The creation of value, through innovation, increasing sophistication and development of new products and processes plays an essential role in the strategic positioning of firms. Value creation goes hand in hand with value appropriation: in fact, firms will only engage in value creation if profitable appropriation is possible (Mizik and Jacobson, 2003). This is an important feature differentiating industries: the capacity of appropriation differs across sectors, and so does the intensity of innovation and the ways in which it is performed.

Traditionally, the emphasis on creating value was put on high-tech sectors, for they were seen as the great engines of innovation, while traditional sectors were considered secondary in terms of innovation and knowledge creation. However, more than 50% of all innovating firms in the EU are non-R&D performers (Aroundel *et al.*,Som *et al.*, 2010; Rammer *et al.*, 2011 *cit in* Som, 2012*)* and non R&D intensive sectors still account for a considerable part (40-60%) of total value added in EU member states (Hirsch-Kreisen, 2008; Som, 2012). More importantly, the concept of innovation has been redefined, leading to a different understanding of the role played by innovation in low-tech industries. Currently, innovation is a far-reaching concept, which is not restricted to the size of technological opportunities, encompassing also the capacity of reorganizing knowledge and marketing strategies, known as *soft innovation* or non R&D innovation (Costa *et. al.*, 2011). Along with the traditional focus on changes in the functionality of products and processes, this new perspective stresses the role played by incremental innovation, customer-oriented services and the optimization of process technologies (Stoneman, 2008; Heidenreich, 2009). In other words, the concept of innovation is more than simply high-tech or radical changes, embracing incremental and service-based changes as well (Heidenreich, 2009; Mendonça, 2014).

Following this general evolution of the concept, the OECD's definition of innovation, presented in the *Oslo Manual* (2005), relates innovation to process and product upgrading (meaning new and improved processes and products), along with new marketing methods, new organisational or business practices, workplace organisation and even by external relations (OECD, 2005).

Under this new approach, a strong emphasis is thus put on the notion of 'soft innovation', which can be described as a way to explore innovation in goods and services

that have substantial impact upon sensory perception and aesthetic appeal (Stoneman, 2008). In the modern economy, assets like symbols and style, attached to property rights such as trademarks and industrial design, are fundamental to the competitiveness of firms, regions and nations. Basically, innovation, concerning this wider view, is the analysis of how goods and services can be simultaneously better and more persuasive (Mendonça, 2014).

The wider notion of innovation, along with the recent focus on its soft dimension has changed the perception of the role played by it as a source of competitiveness in traditional, low-tech manufacturing industries, as the industry under analysis –footwear. According to the well-known taxonomy of Pavitt (1984) and its more recent developments (Tidd and Bessant, 2009) the footwear sector is mostly composed by "supplier dominated" firms, that is, firms in which the pace of innovation is generally weak and occurs often through the acquisition of machinery and materials from suppliers. The typical user is usually price sensitive and the adequate means of appropriation in these industries are trademarks and marketing related ones (advertising, design). The firms follow in many cases a cost-cutting trajectory; their size is normally small, the usage of in-house technology is very rare and engineering capabilities are often weak; technology intensity and orientation is low vertical and process innovation wins over product innovation (Pavitt, 1984; Tidd and Bessant, 2009).

Being a mature industry, R&D investments in footwear are generally not profitable enough. This means that internal R&D and engineering capabilities are relatively low (Heidenreich, 2009). Innovation takes place mostly through the creation of "new value propositions", by developing commercial visibility, reputation, and fame (Mendonça, 2014). This is undoubtedly the case of the footwear industry, which closely follows fashion trends.

Product innovation is less important than process innovation and firms typically concentrate efforts in organisational improvement, the development of special designs, and the achievement of higher quality and flexibility (Heidenreich, 2009). Soft innovation ends up as a product differentiator, helping to adjust the tailored preferences of consumers (Stoneman, 2008).

Pietrobelli and Rabellotti (2004) identified consistent patterns of learning and innovation in traditional manufacturing industries, emphasizing the importance of machinery and chemical industries (suppliers) as well as acknowledging that changes in

production methods and on product design are likely to succeed in these industries (Pietrobelli and Rabellotti, 2004). Later, Som (2012) establishes patterns of innovation based on structural characteristics of sectors which innovate without R&D investments According to his findings, the footwear industry will most likely innovate through its suppliers, which is consistent with the previously presented ideas of Pavitt (1984), Pietrobelli and Rabellotti (2004) and Heidenreich (2009). These volume-flexible specialized suppliers, whose major competitive factors are product quality and price, develop products at an intermediate level of complexity, being responsible for the supplying of parts and components of the final goods. When it comes to manufactures themselves, they are all part of the "manufactures of consumer goods with occasional product development" group, with its major competitive feature being the time of delivery. In this cases, product complexity is usually low (Som, 2012).

Traditional industries have more frequent opportunities to innovate through diversification: both selling to different markets and differentiating its products in distinct quality segments. As in these low tech industries value added is most likely related to delivery or commercialization features, innovation opportunities are more linked to non-technological than to technological ones, which is also consistent with the prior referred studies. In industries such as the footwear, trademarks are the major appropriation means of added value (Von Tunzelmann and Acha, 2005).

According to Hirsch-Kreisten (2008), in industries such as the leather sector, it is important to develop ffashion-oriented design of products and to give a rapid response to changing costumer wishes. Therefore, functional and technical upgrading are the key, and skillful branding strategies pave the way for value creation and appropriation (Hirsch-Kreisten, 2008).

Table 2: Main features of innovation in traditional industries

Level of technology	Source of innovation	Product complexity	Innovation opportunities	Means of value appropriation	Type of innovation	Innovation strategy
Low-medium tech	Suppliers	Low	Non-technological	Trademarks	Process and Functional/Aesthetic	Market Diversification High quality segmentation

Summing up, innovation is an important instrument for the creation of value in traditional industries and should thus be taken into account in the measurement of industry upgrading. Innovation is, in fact, a less explored feature in low-medium tech industries, which for a long time were not seen as innovative. However, taking into account the wider and more recent definition of innovation, and as a certain pattern of innovation is expected in these LMT/traditional sectors (cf. Som, 2012), its measurement adds valuable insights to upgrading concerning product, process and organisational elements.

3. Measuring industrial upgrading

As indicated earlier (c.f. subsection 2.2.), there are different ways to upgrade as well as there are different ways to measure it. Some authors (e.g., Schmitz 2006; Ponte and Ewert, 2009) present a taxonomy of categories of upgrading, distinguishing among product, process and functional upgrading. Schmitz (2006) provides also valuable insights concerning the adequate ways to measure the different types of upgrading: he refers to unit values as proper indicators to measure product upgrading and to own branding as a source of functional upgrading (Schmitz, 2006).

Industrial upgrading was traditionally related to an overall assessment of quality upgrading by the computation of unit values, that embodies foremost product upgrading features. In the 2011's World Bank report, Racine (2011) considers the possibility of achieving industrial upgrading through enhancing the quality of exports – the virtuous circle of high-quality exports, as it is called. In fact, improving the quality of services and goods, as well as diversifying in sectors where quality is important, can be a sustainable source of competitiveness. However, industrial upgrading can be related also to organisational learning and international trade, as pointed out by Gereffi (1999). In order to upgrade, some firms rellocate their efforts from labour-intensive activities to more profitable and skill-intensive ones, such as marketing and design innovations (Gereffi, 1999).

To provide a fuller picture of the industrial upgrading phenomenom in the footwear industry, we thus consider both traditional (i.e., price related) and more recent metrics of quality upgrading.

3.1. Indicators based on price/value added

Traditionally, the analysis of quality upgrading was based on the computation of unit values (Racine, 2011; Kwaramba, 2013). Export unit values are computed as the ratio of nominal exports to quantities (e.g., euros/kg), being expressed as follows:

$$\mathrm{UV} = \frac{Exports\ (value)}{Quantity\ (1000\ kg)} \quad (1)$$

Unit values can be seen as a broad proxy for upgrading, since higher values reflect higher willingness to pay for a given product, and therefore they can signal an increase of overall quality. Values can increase due to shifts to higher product segments and to other value enhancing features, such as rising durability, reliability, compatibility, flexibility; superior inputs or higher skills, greater adequacy to demand, additional functions (e.g., service or maintenance contracts), better design and advertising, among other aspects (Aiginger, 2000; Janger *et al.*, 2011). However, the use of unit values as an indicator of quality has a potential shortcoming, since price increases might be determined by factors other than quality, such as a rise in production costs, the exploitation of market power or successful advertising without a corresponding increase of quality (Khandelwal, 2009; Hallak and Schott, 2011; Kwaramba, 2013).

In order to overcome these deficiencies and distinguish between cost and quality aspects, some studies rely on a measure of "quality elasticity" (Aiginger, 2000). The rationale behind such computation is the following: when the price of a good goes up, while at the same time consumers buy more of it, it can be inferred that the relative quality of that variety has increased such that, despite its higher price, consumers buy more. Conversely, when the price comes down, but sales are not rising, its relative quality may be decreasing. Baldwin and Harrigan (2011) and Vandenbussche *et al.,* (2011) also attest that the relative change of export prices and quantities sold in narrowly defined product categories are an indicator of quality shifts, meaning that when a country exports higher quantities at a higher prices, it most likely means that the product/industry has achieved upgrading (Baldwin and Harrigan, 2011; Vandenbussche *et al.*, 2011).

In a similar line of reasoning Khandelwal (2009) assumes markets have different scopes for quality differentiation, expressed in long and short quality ladders. For a long quality ladder, unit values are relatively more correlated with the estimated qualities and thus prices appear to be appropriate proxies for quality. In contrast, prices appear to be less appropriate proxies for quality in markets with a narrow range of estimated qualities

("short" ladder markets). Following Khandelwal (2009), Fernandes and Paunov (2010) consider that the mapping of unit values to quality is actually appropriate in the industries with more scope for quality differentiation. Also, Grossman and Helpman (1991) add that almost every product exists on a quality ladder, depending on the technological frontier and capacity of ongoing innovation, with some variants below, that may already have become obsolete, and others above, that have yet to be discovered (Grossman and Helpman, 1991).

The computation of unit values permits furthermore to compute export shares in each price segment, identifying a country/industry position in the world price range (Position in Price Segments - PPS). Computations are usually based on the comparison with other relevant producers by defining cutting points in low, medium and high price segments by using percentiles (33th and 66^{th} percentiles, for example). High PPS levels indicate that the country/industry/firm operates in high price exports segments. The share of exports by price segment is a proper indicator of firm/sector capabilities; its change over time reflects efforts by firms to upgrade their products as an answer to international competition, coping with global trade adjustment pressure, not by shifting production to other sectors, but by climbing up the quality ladder within industries (Janger *et al.*, 2011).

Complementarily, and in order to overcome the already referred shortcoming concerning unit values measure, it is possible to apply a similar metric: relative unit values. Racine (2011) suggests that export unit values should be divided by import unit values (which has its own limitations, since exports include freight costs and insurance and imports do not, leading to biased results) or by a benchmark. In this case, comparisons are usually made with reference to relevant producers or direct competitors on the product/industry under study (Racine, 2011).

The measurement of quality changes can also be made using value added indicators. Value added is intrinsic to the very notion of quality competition, since consumers look for valuable characteristics in a product (Aiginger, 2000). Recently, the OECD has developed a database on Trade in Value added (TiVA), which permits to take into account the aforementioned phenomenon of international value chains. Production has become increasingly more fragmented, making it harder to know the precise contribution of each country to the production of a certain good. The set of indicators proposed by the OECD-WTO seeks to analyze the value added by a country in the production of a specific good

or service that is exported, offering a more comprehensive picture of overall trade relations among nations.

Basically, the TiVA indicator disentangles domestic and foreign value-added, through international input-output tables. Conceptually it is possible to decompose any particular product with value V^p into the value-added generated in country *i*, as expressed in Equation 2:

$$V^p = \sum_i VA_i^p \quad (2)$$

The computation of the import content of exports, that is, total imports embodied directly and indirectly within exports and the additional domestic activity induced by this additional production is performed as follows:

$$Import\ content_{exports} = m(1 - A)^{-1}e \quad (3)$$

Where *m* is a *1*n* vector with components m_j (the ratio of imports to output in industry *j*) and *e* is a *n*1* vector of exports by industry (OECD-WTO, 2013).

In this case, a decrease in the import content of exports signals an increase in domestic value added embodied in gross exports and therefore, an increase in the sophistication of exports/production. It is also possible to compute the foreign value added content of gross exports to obtain the opposite relationship, evaluating to what extent the fragmentation of production is affecting the sophistication of exports in a given country.

3.2. Innovation indicators

Although the most commonly used indicators of upgrading rely on price computations, as indicated in the previous section, upgrading is a wide concept which can also be proxied by many other indicators, usually included within the broad phenomenon of innovation. However, measuring innovation is not an easy task. As a multidimensional phenomenon, it has been studied using a variety of different indicators, ranging from patents, R&D investments, financial and human resources features, scientific publications, to industrial designs and trademarks (Mendonça, 2014).

The use of innovation indicators for the assessment of upgrading is usually preceded by a careful reflection on the industry's characteristics. More precisely, an understanding of the degrees of opportunity, appropriability and cumulativeness seems to be in order (Malerba and Orsenigo, 1997), as explained in Section 2.3. With that being said, R&D expenditure and patent applications are typically more related to high-tech industries, which show higher levels of appropriability of the gains associated to innovation. On the other hand, trademarks and intangible assets are relatively more important in low and medium-low tech industries, as it is the case of footwear (Greenhalgh and Rogers, 2006, Heidenreich, 2009; Utterback and Suarez, 1993).

Although a distinction among different categories of innovation can be performed in theoretical terms, there is a broad margin of overlap. In manycases the several types of innovation are intertwined, being difficult to define them in a precise manner and to establish the correspondent metrics. To sustain our analysis, we follow the well-known OECD's Oslo Manual (2005), as well as Stoneman's (2009) guidelines, defining a set of comprehensive indicators, which take into account product, process and organisational feauture of innovation.

3. 2.1. Product innovation

Product innovation has a close link to product upgrading (generally studied through the computation of unit values, as stated before). Product innovation refers to significant changes and improvements concerning existing products or services (Stoneman, 2009). Novel products differ from the previously produced, being possible to identify improvements in its characteristics or intended uses. According to OECD's Oslo

manual (2005) any changes regarding enhancements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics are considered product innovation. However, product innovation is a wide concept which embodies both aesthetical and functional features; the aesthetical side of product innovation is more related to soft innovation itself and is not defined by functionality (Stoneman, 2009). Therefore, and in order to distinguish functional product innovation from aesthetical product innovation, we have decided to include the latter in the marketing innovation group. This distinction is important, especially because product innovation of the functional type is not very common among LMT industries, however, aesthetical and marketing innovations are (c.f. Section 2.3).

Marketing innovations refer to the implementation of new marketing methods, involving significant changes in product design or packaging, product placement, promotion or pricing. This concept is deeply related to establishing a good positioning for a firm's product on a market, as well as increasing sales by better meeting costumers' needs (OECD, 2005). The OECD's concept of marketing innovation overlaps with the concept of soft innovation outside creative industries, which is the case of the footwear industry. In fact, the presented concept considers aesthetical elements, such as changes in product design and packaging. These changes have to do with products' appearance rather than their functionality, which is why we gather marketing and aesthetical innovations in one group. Marketing and aesthetical innovations have to deal with brand image (which is the perception of a brand in costumers' minds) and product differentiation, meaning that, if two products are generically the same and they still can be individually identified, they have specific characteristics which make people choose one over the other. Costumers' preferences may be influenced by the product's performance or aesthetic appeal, such as design, colour or size (Stoneman, 2009).

In this line of thought, and even though both of these concepts are part of a bigger picture that is general product innovation, they cannot be assessed similarly. As Heidenreich (2009) refers, three effects of product upgrading can be expected: increased range of products and services, new markets or increased market share, and improved quality of products and services. The latter was already explained in Section 3.1.; as for increased range of products and services, the number of patent applications seems to be

an accurate indicator since it is directly linked to product's newness and the very definition of product innovation.[9]

According to Mendonça (2014), patents are usually a proxy for R&D spending that, as referred before, is way more common in high-tech industries (cf. Heidenreich, 2009). Therefore, and as traditional industries are characterized by low degrees of opportunity, appropriability and cumulativeness (Malerba and Orsenigo, 1997), R&D investments generally do not increase their market value (Greenhalgh and Rogers, 2006), which partially explains the residual role of patent applications in these sectors (Heidenreich, 2009; Utterback and Suarez, 1993). Also, patents refer solely to one of the product upgrading factors; the analysis "new markets and increased market share" (Heidenreich, 2009), which is deeply related to marketing and aesthetical innovations, is also important. How should it be measured then?

Stoneman (2008) states that soft innovation (including aesthetical and marketing features) cannot be patented, only trademarked. Some authors emphasize that the trademark indicator was proposed some time ago as proxy of product and marketing innovations (Schmoch 2003, Mendonça *et al*., 2004).

Nowadays, trademarks are seen as a useful complement to the list of metrics on innovative activity, as well as acknowledged as a proxy for strategic intent and performance in markets characterised by non-price/quality competition, which applies to the footwear industry. Trademarks can also point to marketing investments for they reveal a commitment to develop useful knowledge on consumer behaviour. They are used to protect corporate identity systems, commonly known as brands, which conceive distinctiveness to products, conveying both words and/or images (Mendonça, 2014). As defined by WIPO, a trademark is a distinctive sign identifying certain goods or services as those produced or provided by a specific trader (WIPO, 2013).

Nevertheless, trademarks are not the only feature capable of assessing marketing investments, brand image or aesthetical appeal. In fact, marketing and design both play a relevent role in LMT industries (Pavitt, 1984; Heidenreich, 2009). As already referred,

[9] A patent is a set of exclusive rights granted by law to applicants for new, non-obvious and commercially applicable inventions. It is valid for a limited period of time (usually 20 years), during which patent holders can exploit their inventions exclusively. In return, applicants are obliged to release their inventions to the public enabling others, skilled in the field, to replicate them. The patent system is designed to encourage innovation by providing innovators with time-limited exclusive legal rights, enabling them to appropriate a return on their innovative activity (WIPO, 2013).

trademarks can be used as a proxy for strategy and marketing investments, but aethetical appeal is better addressed through what we call industrial designs. Therefore, the analysis of industrial design applications must also be taken into account. Industrial designs protect the visual appearance or eye appeal of useful articles – so, even though functionality is attributed to these articles, it is not covered by industrial designs. They are applied to a wide variety of industrial products and handicrafts and refer to either ornamental or aesthetic aspects, including compositions of lines, colours or three-dimensional forms that give a special appearance to a product or handicraft. The holder of a registered industrial design has exclusive rights over the design and can prevent unauthorized copying or imitation of the design by third parties (WIPO, 2013).

Taking into account their importance to LMT industries both trademarks and industrial design applications will thus be used to verify if there has been any improvement related to marketing and aesthetical innovations.

To sum up, we have established two different groups of indicators to study product innovation. The first one has to do with the introduction of new products/services or improvements on its functional aspects. The other is related with marketing/branding elements and aesthetical appeal, which are soft innovation features that play an important role on brand image building and product differentiation, having therefore product-wise implications.

3.2.2. Process innovation/ upgrading

Process innovation and process upgrading are two similar concepts and that is the reason why they are put together in this section.

Process upgrading, according to Ponte and Ewert (2009),is the achievement of more efficient ways to turn inputs into outputs, usually obtained through the reorganization of production activities. Schmitz (2006) supports the aforementioned view and adds that increasing production effeciency can also be obtained by the use of superior machinery/technology.

The concept of process innovation embodies the same efficiency prospect. A process innovation is the implementation of a new or significantly improved production or delivery method. Process innovations can be intended to decrease unit production or delivery costs, to increase quality or to produce or deliver new or significantly improved

products (OECD, 2005). Simply put, one can say that a process innovation is expected to generate process upgrading; one is the consequence of the other.

The first peril concerning these concepts, as we have stated previously, is that, for instance, it may be difficult to sometimes distinguish product from process upgrading (Ponte and Ewert, 2009), as well as product and process innovation can be interdependent.

Process innovation is usually more important in low-tech industries (Heidenreich, 2009). Generally, a rising importance of process innovation is an indicator of a cost-cutting strategy, provoked by the stronger role played by cost competition and economies of scale. So, it should be noticed that although process innovations lead to process upgrading they can also lead to a downgrade competition-wise (Ponte and Ewert, 2009; Heidenreich, 2009). Some firms which engage in the process innovation run, end up using it as a way to lower their prices, since their production costs are reduced, increasing their market shares. On the other way around, they can still sell at the same prices and increase profits (Greenhalgh and Rogers, 2007). However, process innovation does not necessarily mean a cost-cutting strategy. It is used in many cases in LMT industries to compensate for the limited role of product innovation: since it is difficult for a LMT industry to compete by developing new products, process innovation comes as one of the prior alternatives, one that can point to cost competition (Heidenreich, 2009).

We are now aware of the meaning of these two concepts and its consequent implications. The question is, how to measure process innovation/upgrading then? Since their definitions are based on the notion of efficiency, an assessment on productivity (GVA per hour) changes can be taken into acount. Productivity growth is essential to upgrading as already mentioned on section 2 – an increase in productivity shows products are being manufactured more efficiently and, if that is the case, a process change might be the cause. Also, as footwear industries belong to the group of supplier dominated firms, their process innovation activity is highly dependent on its suppliers – the main source of technological change (Heidenreich, 2009). Therefore, use can also be made of indicators such as machinery and software acquisition: as it related to the reorganization of production activities and the acquisition of superior technology, Gross Fixed Capital Formation and particularly its materialization in machinery and software investment are also approppriate indicators to assess process innovation.

3.2.3. Organisational innovation/functional upgrading

Organisational innovation and functional upgrading are also close concepts themselves that seem to be somehow less explored than the others. Organisational innovation refers to the implementation of a new organisational method in business practices, workplace organisation or external relations (OECD, 2005); these practices could be for instance the implementation of teamwork in production; supply chain management or quality management systems. Even though the importance of organisational innovation as a source of competitiveness is undeniable, it is highly dependent on product and process innovations, meaning its success relies on the firm's degree of technological development (Armbruster *et al.,* 2008).

Functional upgrading, in turn, has to do with acquiring new functions (or abandoning old ones) that increase the skill content of activities, meaning it is influential at the organisational level (Ponte and Ewert, 2009). In order to assess organisational innovation/functional upgrading, we need to find the right ways to measure the usage of different business practices/functions. In this case, and especially regarding organisational innovation, it seems to be mostly focused on internal procedures of a firm, and thus the measurability at the industry level is hard to achieve. However, and as referred by Mendonça (2014), human resources are the main indicator when it comes to measuring the skill content of activities and its change over time. For instance, an increase in the intensity of use of skilled labour may indicate the creation and development of new (and more valuable) functions. An indirect way to see this relies on the analysis of industry's wages evolution: higher relative wages may signal a more intensive use of skilled labour and thus signal functional upgrading.

3. 3. Selected indicators

To help summarize what has been described in the previous sections Table 3 presents each type of upgrading, a simplified description and the chosen metrics to assess each feature.

Table 3: Summary of upgrading metrics

Feature		Definition	Selected metrics
PRODUCT	**Product Upgrading**	Moving into more sophisticated products with increased unit value	• Unit Values; • Exports shares per price segment; • Relative Unit Values • TIVA indicators
	Functional product innovation	The introduction of a good/ service that is new or significantly improved. Includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics	• Patents
	Marketing and aesthetical product innovation	Implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.	• Trademarks; • Industrial Designs
PROCESS	**Process upgrading**	Involves increasing production efficiency through improved organization of production systems or the use of superior technology	• Productivity changes • GFCF • Software investment
	Process innovation	Implementation of a new or significantly improved production or delivery method.	
ORGANIZATION	**Organisational innovation**	Implementation of a new organisational method in business practices, workplace organisation or external relations)	• Wages; Relative Wages • High/medium/low skilled work shares
	Functional Upgrading	Acquiring new functions (or abandoning old ones) that increase the skill content of activities	

4. The Portuguese footwear sector: climbing up the quality ladder?

4.1. Portuguese footwear: major features and recent trends

In order to better portray the Portuguese footwear industry and its competitive position, we start by providing a preliminary assessment of its major features and recent trends.

The Portuguese footwear industry is a traditional exporting sector. Exports are the main destination of production, accounting for more than 80% of total sales between 1994 and 2011 (Figure 1).

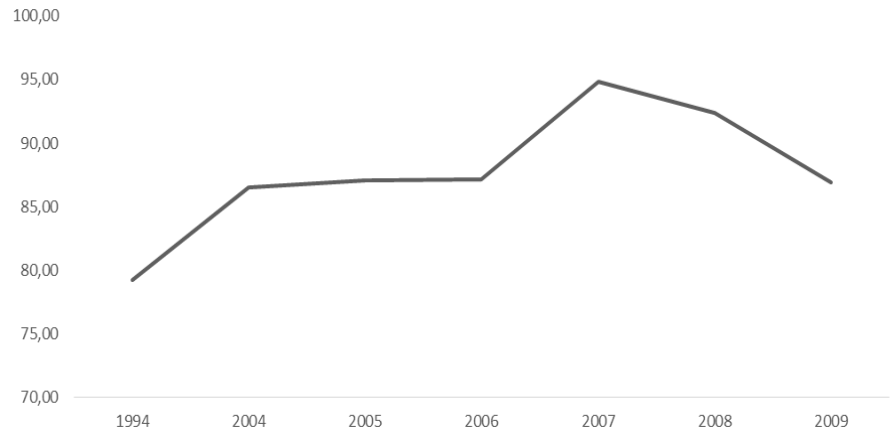


Figure 1: Share of Exports in Footwear Production (value), 1994-2009

Source: APICCAPS

Not only footwear is a traditional exporting activity, but it has also a relevant position worldwide. Portugal holds one of the highest export shares, lying consistently among the twelve top exporters over the last decades (Figures 2 and 3).

In 2012, Portugal was the eleventh most important world exporter of footwear, considering the value shares of exports around the globe. China, Italy and Viet Nam are the top three exporters, being responsible for about 60% of the world exports. Portugal has experienced a fall in its global position, for in 2004 it was the ninth greatest exporter and, back in 1995, the seventh. In 2012, Portugal is out of the top ten, with its value share reduced to 1.9%. The decreasing position of Portugal in the world ranking accompanies the fall of Spain and Italy, which have also lost their leading positions during the last years.

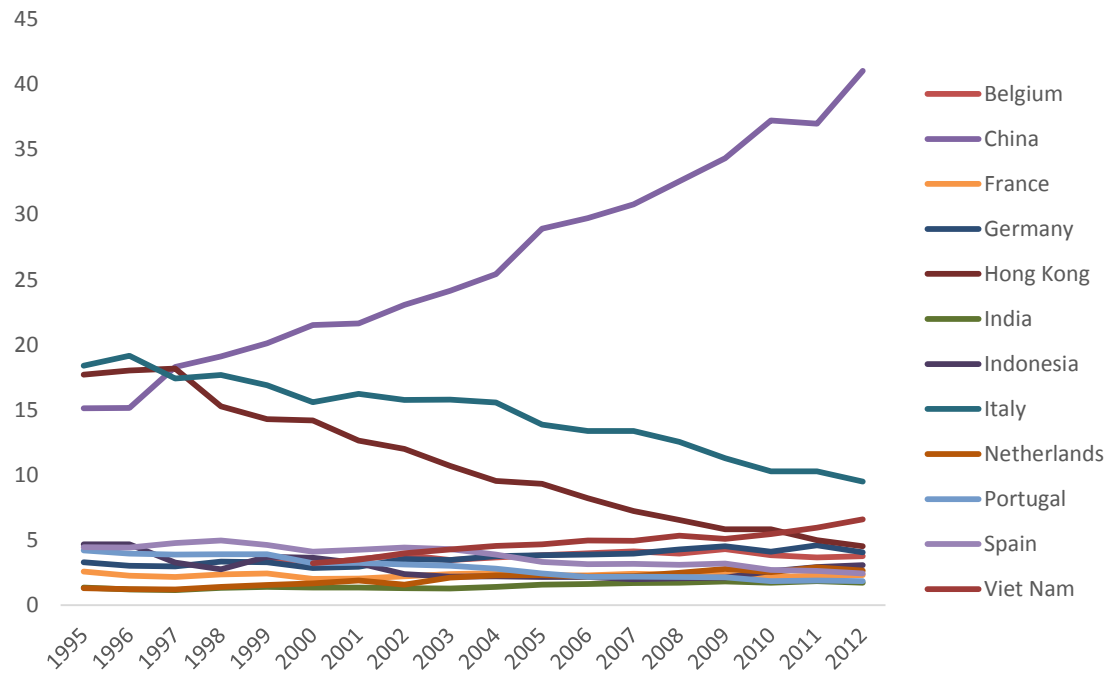


Figure 2: Evolution of world export shares in footwear (value) (%; 1995-2012, major exporters)

Source: UN Comtrade

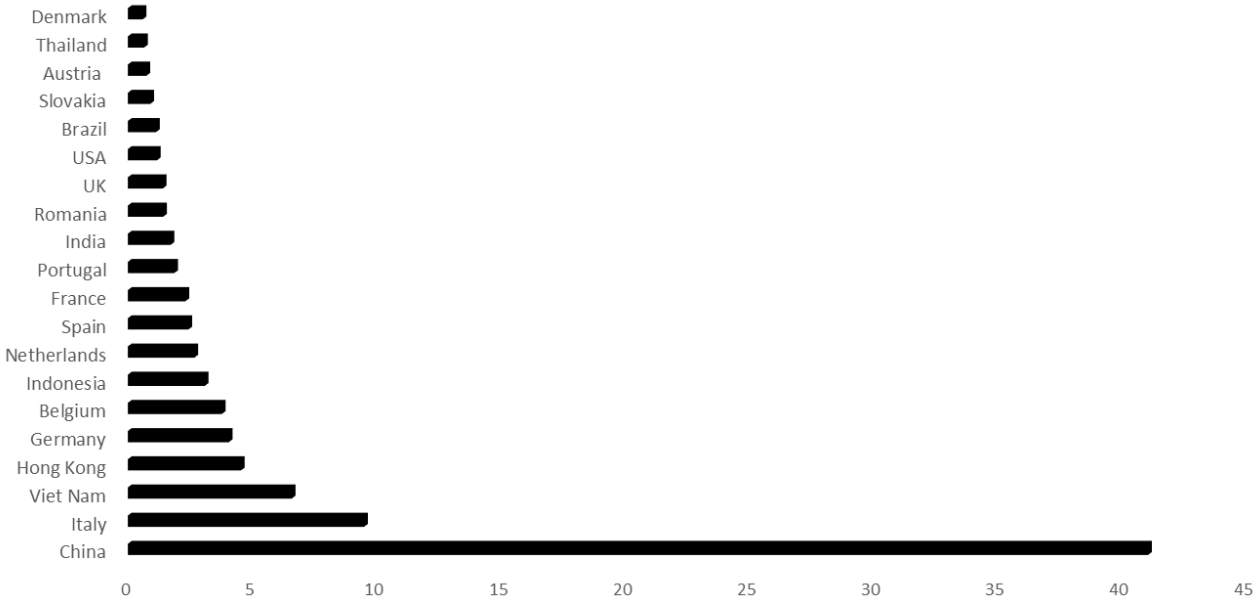


Figure 3: Footwear top exporters export shares (%; 2012)

Source: UN Comtrade

In terms of the composition of footwear exports, there are significant differences across countries. In the Portuguese case, there is a category which stands out amongst the existing ones: leather shoes (Table 4; Figure 4).

Table 4: Composition of footwear exports (Portugal; 1995-2013).

	1995	2000	2005	2010	2013
Waterproof footwear	1.3	2.6	4.8	11.7	12.4
Other rubber and plastic footwear	0.8	1.9	3.7	5.2	5.0
Leather footwear	**81.9**	**77.7**	**71.6**	**66.3**	**69.5**
Footwear with textile uppers	3.0	3.6	3.8	4.6	2.6
Non specified footwear	4.4	4.9	5.5	4.9	3.8
Parts of footwear	8.5	9.2	10.5	7.3	6.8

Source: UN Comtrade and author's computations

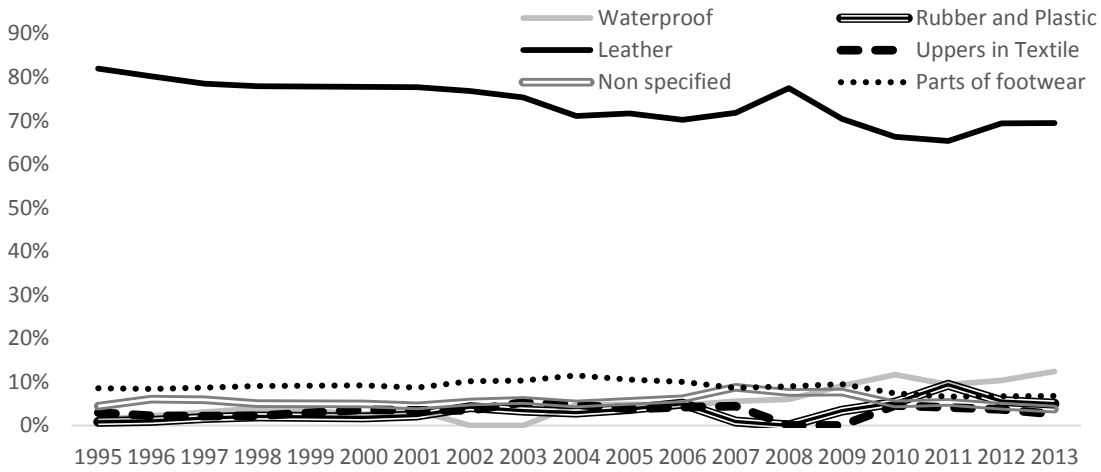


Figure 4: Evolution of footwear categories in total footwear exports (%; Portugal, 1995-2013).

Source: UN Comtrade and author's computations

Leather shoes are the most exported footwear category, even though a decline has been detected over time. In fact, in 1995 about 82% of footwear exports stemmed from this category; in 2013, the corresponding figure is about 70%. This drop is possibly related to an attempt to keep up with new fashion trends, since the relative importance of leather shoes has been decreasing in most of the top 20 countries[10]. Nonetheless it is worth

[10] See Table A.3. in annex.

noticing the increasing share of both plastic and rubber related categories: waterproof footwear and other rubber and plastic footwear. These categories, and specially the first one, have been enhancing their exporting recognition lately, even though and overall leather shoes are the dominant export category in Portugal.

Table 5 provides information on the composition of footwear exports of other major world exporters.

Table 5: Composition of footwear exports, top 20 countries, 2012, %)

	Waterproof footwear	Other rubber and plastic footwear	Leather footwear	Footwear with textile uppers	Non specified footwear	Parts of footwear
Austria	1.6	27.1	**48.3**	10.2	2.7	10.1
Belgium[1]	1.9	**35.9**	33.8	26.7	0.7	1.0
Brazil	0.6	**56.1**	21.9	3.3	0.8	17.4
China	2.2	**48.1**	14.8	17.9	10.7	6.3
Denmark	6.1	8.5	**53.4**	27.7	2.5	1.9
France[2]	6.7	26.1	**30.2**	24.0	3.8	9.2
Germany	1.5	30.7	**37.2**	19.6	19	9.2
Hong Kong	2.7	23.2	**44.7**	12.5	1.3	15.6
India	0.0	8.9	**59.4**	6.2	0.7	24.7
Indonesia	0.4	18.0	**57.8**	20.5	1.6	1.7
Italy	6.4	11.1	**45.3**	6.3	1.4	**29.5**
Netherlands	4	26.6	**41.9**	21.8	2.9	2.8
Portugal	10.3	5.6	**69.4**	3.7	4.4	6.7
Romania	2.9	15.3	**48.6**	5.9	4.9	22.4
Slovakia	2.5	18.2	**53.0**	12.7	2.4	11.3
Spain	1.3	**30.1**	**29.8**	22.6	4.3	11.9
Thailand[1]	2.17	35.0	**39.5**	13.5	1.0	9.0
UK	1.2	**52.5**	25.4	16.8	3.3	0.8
USA	7.1	19.5	25.0	8.2	10.6	**29.5**
Viet Nam[1]	0.4	**32.6**	28.8	30.3	2.8	5.2

Notes: 1) Reference year: 2011; 2) Reference year: 2013.

Source: UN Comtrade and author's computations

As shown in Table 5, most of the 20 top countries export primarily leather shoes, being thus direct competitors of Portuguese firms. This is notably the case of Austria, Denmark, France, Germany, Hong Kong, India, Indonesia, Italy, Netherlands, Romania,

Slovakia and Thailand. Among the aforementioned countries, Portugal presents the highest share of exports in the leather category, accounting for about 70% of total exports. In Belgium, Brazil, China, Spain,[11] UK and Viet Nam, rubber and plastic shoes are the most exported category in 2012, whereas in the US exports footwear components are dominant.

Looking to the overall evolution of the industry's characteristics in Portugal over time, some clear patterns emerge. In terms of geographical location, the industry is strongly concentrated in northern Portugal. There is an important cluster around Porto, as shown in Figure 5. In 2011, the North region hosted about 87% of the existing footwear companies and almost all the employment (91% of the employees) (cf. Figures 6 and 7). This strong concentration seems to corroborate the importance of agglomeration economies in the formation of industrial competitiveness, in line with some theories discussed earlier (e.g., Krugman, 1980; Porter, 2002) As displayed in Figure 3, the footwear cluster is strongly dependent on machinery suppliers, local software developers and on another identified cluster: the leather cluster, located in the center of the country. This dependence on suppliers has been explained before and confirms the typical innovation patterns on LMT sectors (cf. Pavitt, 1984; Heidenreich, 2009). As this is a fashion-driven industry, it has to rely in different functional and aesthetic aspects as well, such as shoe design, branding strategies and marketing and distribution features.

[11] Spain is a great exporter of leather shoes as well, although in 2012 plastic and rubber shoes were the most exported footwear category, closely followed by leather shoes.

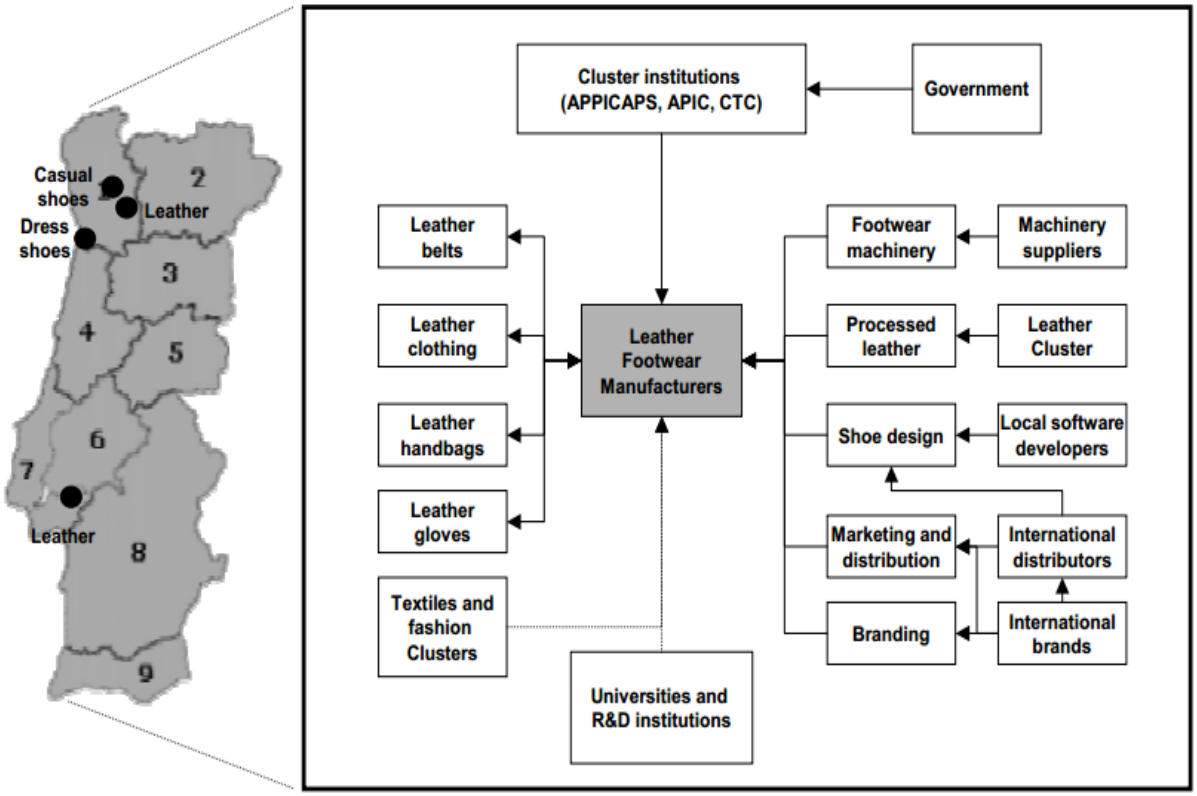


Figure 5: Location of footwear clusters in Portugal

Source: Porter (2002)

Looking now to the recent evolution of several economic indicators at the industry level, it becomes evident the influence of a number of significant external shocks observed since approximately the turn of the century. During this period, an overall decline in competitiveness was experienced by the Portuguese economy, as shown by the increase in the real effective exchange rates (Figure 6), which was accompanied by China's entry in the World Trade Organization in 2001, the European Union enlargement to the East in 2004 and the strong appreciation of the euro against the dollar influenced profoundly Portuguese footwear competitiveness, being reflected into a significant decline in trade, production and employment.

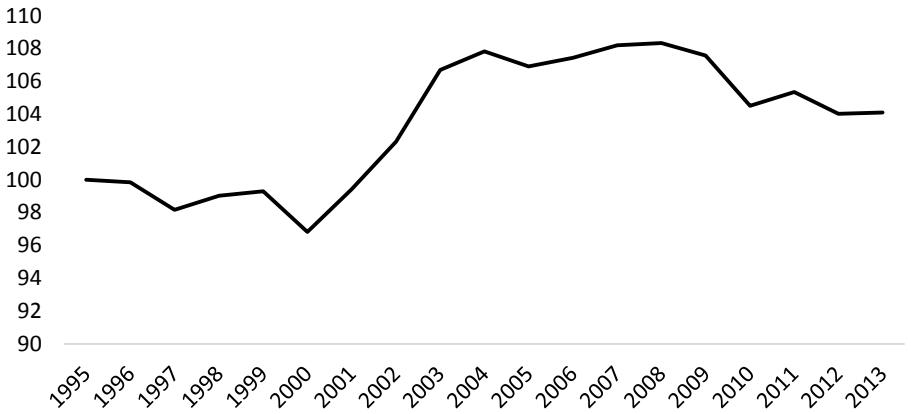


Figure 6: Real effective exchange rates (index, 1995=100) Portugal, 1995-2013

Source: OECD.stat

First of all, when analysing the volume of Portuguese exports since 2000, an overall declining trend is observed, although recently there seems to be some signs of a mild recovery (Figure 7).

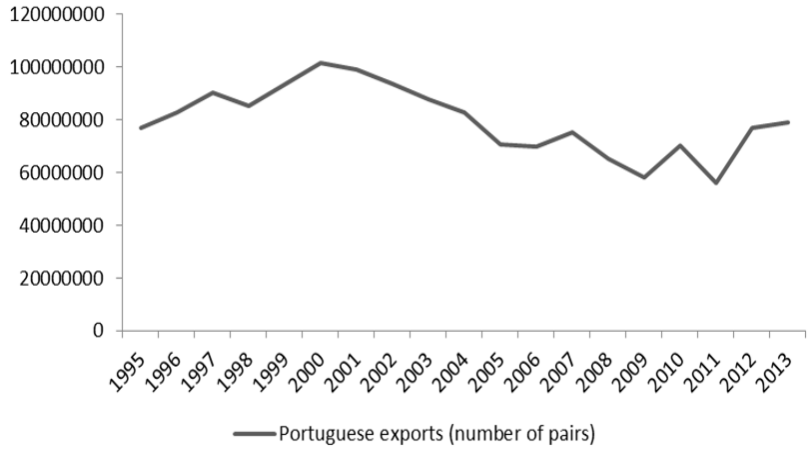


Figure 7: Portuguese footwear exports (nr. of pairs), 1995-2013

Source: UN Comtrade

The significant decline in exports volume (between 2000 and 2012, the quantity exported declined in about a quarter) (Figure 7) has been accompanied by a strong decrease in several other economic indicators, including production, number of firms and employment (cf. Figures 8-10). In all cases a significant and almost continuous decline is observed until very recently, being particularly strong when employment is taken into account.

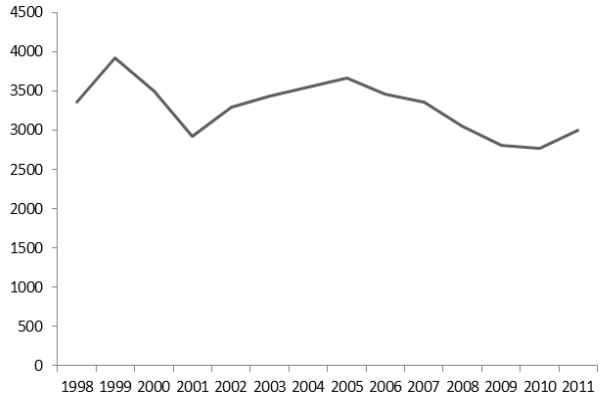


Figure 8: Number of firms

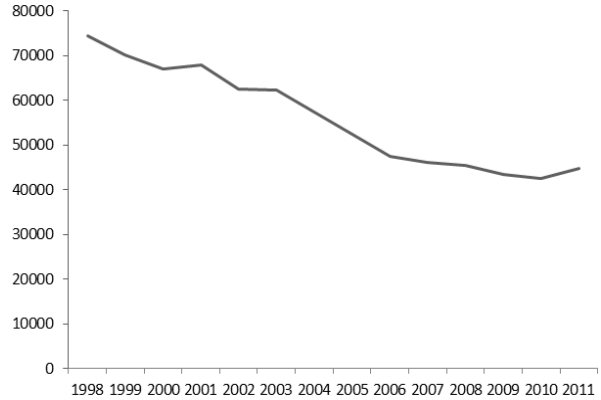


Figure 9: Number of employees

Footwear sector, Portugal, 1998-2011

Source: INE

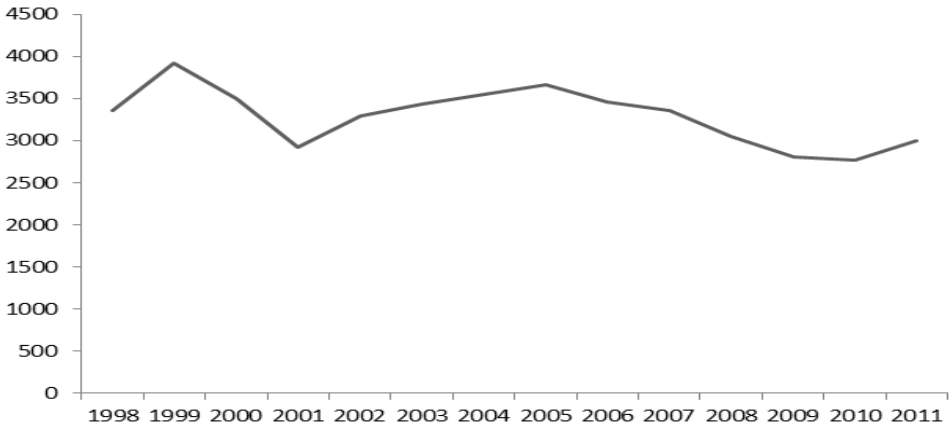


Figure 10: Gross value added (footwear, 2000 prices)
Portugal, 1998-2011, Source: INE and author's computations

In fact, the decline in all these variables following the aforementioned shocks seems to indicate that a close relationship between these factors has been in place. In an overall perspective, the results obtained for these three indicators are very similar (in terms of trend) to the one observed in Figure 7.

Figures 8 to 10 show some signs of a slight reversion of the declining trend, during the latest years. This evidence has been interpreted as an indication of a successful response of Portuguese firms to the broad globalization challenges, by targeting higher

price segments and by creating value, through innovation. In the following section an analysis of the merits of such an explanation are put under investigation.

4.2. Is there evidence of significant upgrading?

As indicated earlier (cf. Section 3) the assessment of industrial upgrading is performed using a vast set of indicators, in an attempt to shed light on the multidimensional character of "upgrading". The analysis covers the period since 1995, taking into account the Portuguese experience and, when possible, comparing it to the major footwear competitors.

The computation of footwear export shares (in value) for all countries covered by UN Comtrade since 1995 reveals that a set of 20 countries has been responsible for at least 85% of the world exports[12]. Taking this into account, we decided to consider in our sample, for comparative purposes, the following countries: Italy, China, Hong Kong, Germany, Viet Nam, Indonesia, Belgium, Spain, Netherlands, Brazil, Romania, France, India, UK, Thailand, Austria, USA, Slovakia and Denmark.

Table 6 provides a list of the data sources for the selected indicators for each upgrading dimension (cf. Section 3.3.).

Table 6: Data sources of the selected upgrading indicators

Dimension	Indicator	Source
Product/ overall quality upgrading	• Unit values	UN Comtrade
	• Export shares per category of commodity	UN Comtrade
	• Domestic and foreign content of exports	TIVA, OECD-WTO database
Product Innovation (functional) Product Innovation (Marketing and aesthetical innovation)	• Patents • Trademarks • Industrial designs	INPI WIPO's Global Brand Database
Process innovation and upgrading	• Productivity changes	EU KLEMS
	• GFCP	INE
	• Capital and Software Investments	EU KLEMS
Organisational innovation/ Functional Upgrading	• Wages/relative wages	Eurostat
	• Shares of high/medium/low-skilled workers	EU KLEMS
	• Labour compensation	

[12] Detailed information on this matter can be consulted in annex (Table A.2.)

4.2.1. Price and value added indicators

We start our assessment on upgrading by computing the most widely used measure of quality upgrading: unit values. Data on exports value and net weight has been gathered for our sample of countries between 1995 and 2013 from the UN Comtrade database, using the 64 commodity code (Footwear, gaiters and the like, parts thereof) from the Harmonized System (HS) classification[13].

Figures 11 and 12 present Portugal's average unit values[14]' over the period under analysis (1995-2013). There is a global increasing trend up until 2009, despite a trough is found in 1999. After 2009, a slight decrease is detected, being followed by a recovery in the subsequent years. This rising trend is also observed when a correction is made of the increase in prices solely due to inflation, by considering 2000 prices (cf. Figure 12).

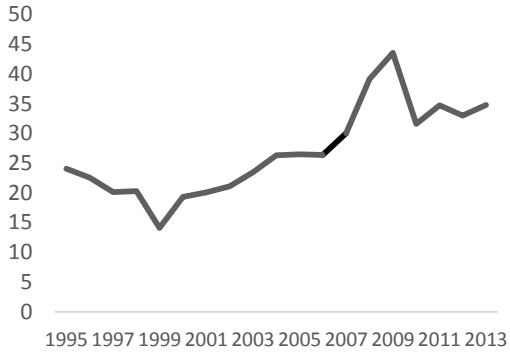


Figure 11: Export Unit values, footwear (Portugal, current prices, 1995-2013)

Figure 12: Export unit values, footwear (Portugal, 2000 prices, 1995-2013)

Source: UN Comtrade

Table 7 presents the results by export category. As expected, the category which presents the highest unit value is leather shoes (6403), the specialty amongst Portuguese shoes. Leather shoes have almost continually increased its value over time, experiencing

[13] The 64 commodity code has the following subdivisions: 6401: Waterproof footwear, rubber, plastic; 6402: Other footwear with outer soles and uppers of rubber or plastics; 6403: Footwear with uppers of leather; 6404: Footwear with uppers of textile materials; 6405: Non-specified footwear (soles not in leather, rubber or plastic) and 6406: Parts of footwear.

[14] Average unit values reflect a weighted average of unit values for single footwear categories. The weights reflect the shares of each category in total export volume.

some fluctuations between 2009 (when the highest value was registered) and 2013. Nonetheless, the biggest change is found in category 6405 (non-specified shoes), which shows the greatest increase in value since 1995. Rubber and plastic shoes (category 6402) and footwear with textile uppers (6404) have also reached considerably high results in 2013, especially the latter, which is currently close to leather shoes' UV.

Table 7: Export unit values per footwear category (Portugal, 1995-2013)

Category	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
6401:Waterproof footwear	3.7	4.3	3.4	2.9		5.7	6.1			7.2	7.1	7.3	7.7	9.9	7.4	4.5	5.0	5.1	5.0
6402: Other rubber and plastic footwear	20.5	16.9	11.9	14.8		10.6	11.7	10.5	11.4	13.0	12.4	13.2	78.0		30.2	14.2	9.0	13.5	21.4
6403: Leather footwear	25.0	23.7	21.4	22.0		21.6	22.4	23.8	27.0	31.5	31.6	31.8	35.6	45.0	54.0	40.3	45.1	40.9	43.1
6404: Footwear with textile uppers	15.1	15.4	14.5	15.3		12.2	13.0	12.8	13.6	17.5	18.2	18.0	20.4			15.5	18.8	22.5	29.3
6405: Non specified footwear	19.9	19.4	18.9	20.7		14.2	14.7	14.5	15.6	19.3	19.4	19.6	16.2	29.3	31.3	36.1	42.0	37.3	40.1
6406: Parts of footwear	24.1	21.8	18.3	15.4	14.1	11.9	12.8	11.2	10.9	12.4	12.4	11.1	11.9	16.4	15.7	14.7	15.1	13.1	12.9
Average UV	**24.06**	**22.58**	**20.14**	**20.27**	**14.12**	**19.35**	**20.07**	**21.08**	**23.45**	**26.32**	**26.47**	**26.37**	**30.05**	**39.15**	**43.57**	**31.58**	**34.73**	**33.00**	**34.79**

Table 8 provides information on major footwear exporters' unit values in 2012. Just as it happens with Portugal, the great majority of these countries charges higher prices for leather shoes.

The results show different specialization patterns as well as different price segmentations for each country. Taking a close look, it can be seen that there are different price segmentation groups among the top 20. If we were to select a top 8 based on the countries with the highest average UV in 2012, those would be: Austria, Denmark, France, Germany, India, Italy, Portugal and Slovakia. However, since our research focus on the period between 1995 and 2012/3, our selected top 8 is slightly different. Computing the average unit values of these 20 countries in the selected period, the countries which present the highest average results are Austria, Denmark, France, Germany, Italy, Portugal, Spain and the UK[15]. These countries lead the highest price segment on footwear.

[15] India presents higher average results than France, however, due to numerous cases of missing values in some footwear categories and lack of information regarding other indicators, its position in the top 8 was replaced by France.

Table 8: Unit values per footwear category (Top 20 exporters; 2012)

	Waterproof footwear	Other rubber & plastic footwear	Leather footwear	Footwear with textile uppers	Non specified footwear	Parts of footwear	**Average UV**
Austria	19.4	28.8	**67.0**	41.2	55.1	21.8	**48.4**
Belgium[1]	8.5	21.1	42.4	25.4	26.4	18.9	**29.8**
Brazil	12.1	14.6	42.7	28.7	25.4	19.1	**22.0**
China	5.6	8.3	16.0	10.1	13.4	8.5	**10.5**
Denmark	16.5	25.2	51.6	35.5	29.5	21.5	**41.7**
France[2]	15,6	22.9	80.8	31.2	39.3	18.0	**42.1**
Germany	12,1	24.8	49.4	27.2	32.5	25.8	**34.5**
Hong Kong[1]	6,9	20.0	43.9	24.4	24.1	11.2	**29.6**
India		21.8	57.4	35.7	36.8	25.1	**44.7**
Indonesia	9.5	15.1	19.1	16.4	10.1	23.1	**17.7**
Italy	7.3	26.2	72.8	44.0	49.6	12.8	**43.6**
Netherlands	10.4	23.8	44.3	29.9	18.8	13.2	**32.7**
Portugal	5.1	13.5	40.9	22.5	37.3	13.1	**33.0**
Romania	5.1	17.8	28.1	20.1	25.8	26.6	**25.0**
Slovakia	13.1	27.1	37.5	19.5	17.6	42.2	**32.8**
Spain	18.7	11.0	56.9	23.4	27.7	11.9	**28.4**
Thailand	8.2	17.9	40.4	21.5	26.8	8.6	**26.3**
UK	14.9	4.7	41.2	19.4	43.4	21.9	**18.0**
USA	8.7	23.3	45.2	32.9	28.7	15.8	**26.9**
Viet Nam[1]	7.3	20.8	42.0	24.7	25.3	13.5	**27.8**

Notes: 1) Unit values refer to 2011; 2) Unit values refer to 2013.

By analyzing UV results and export shares, we come to the conclusion that the great majority of the top exporters is competing within the same segment: high priced leather shoes. Actually, in the top 8, from here on referred to as "the highest UV countries" leather footwear is the category with the highest UVs, confirming the expected finding: leather shoes are likely to sell at highest prices.

For comparative purposes, relative unit values are also computed, i.e., the ratio of Portugal's average UV to the TOP 20 exporters' UV average and to the highest UV countries. [16]

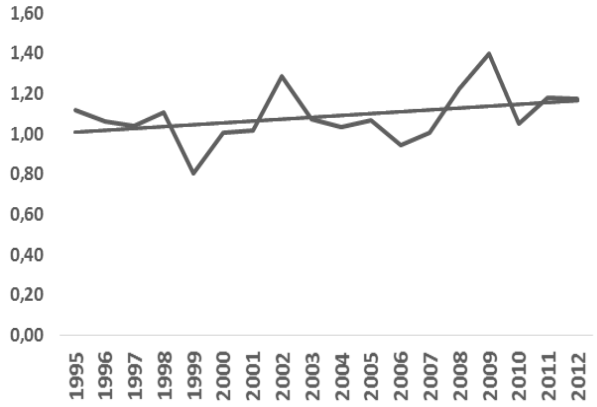


Figure 13: Relative UV of Portuguese exports (Top 20; 1995-2013)

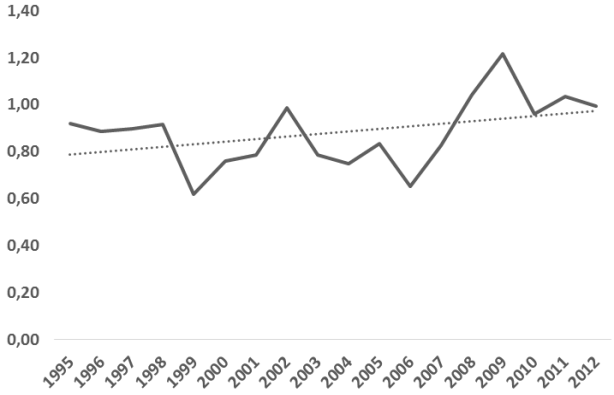


Figure 14: Relative UV of Portuguese exports (Highest UV countries; 1995-2013)

Source: UN Comtrade and author's computations

From Figures 13 and 14 we can conclude that although an increase in unit values is found, suggesting an overall increase in quality, the comparison with other countries does not evidence a significant change in the relative positioning of the Portuguese footwear sector, especially when the comparison is established with the top 8. Figure 15, which portrays the same comparison as Figure 14 but with regard to leather shoes solely, shows more clearly the increasing trend obtained for this category. Nonetheless, even in its best performing category, Portuguese average unit values are still below the Top 8 average (Figure 15).

[16] See Table A.4. in annex for further information

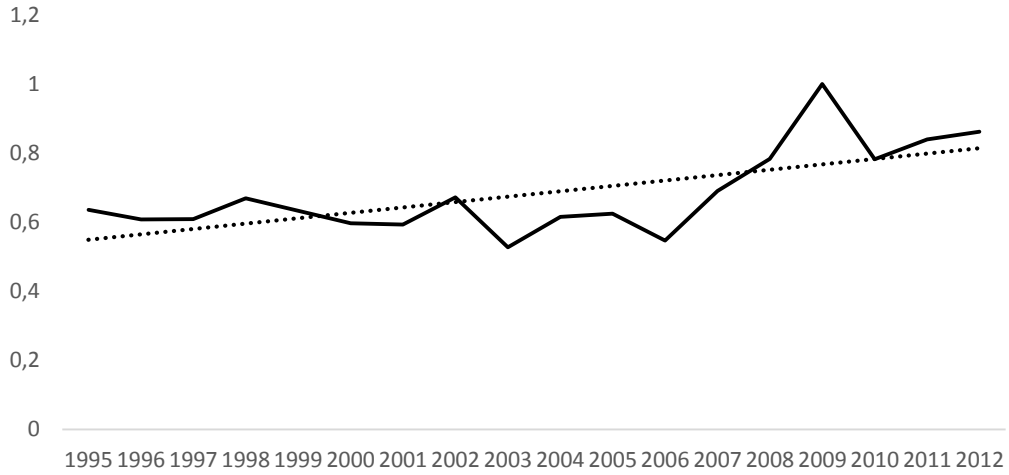


Figure 15: Relative UV of national Exports to Highest UV countries (leather shoes), 1995-2012

Source: UN Comtrade

In terms of export composition, the countries which are more similar to Portugal are Spain and Italy (even though Spain presents a less stable UV variation). Italy is known for its shoes tradition and has been referred to as the country which sells at highest prices, being immediately followed by Portugal according to the media. For that reason, we compare unit values for both countries, establishing the relative unit value of Portugal's exports to Italy's (Portuguese average UV/Italian average UV). When it comes to the export structure, the Italian case is very similar to Portugal's, except for the fact that in Italy the components of footwear category is way more relevant. This can be an indicator of how Italy's competitive advantage is also leveraged on support industries, being intimately related to the fashion design industry, a complementary one.

In this case, and contrary to what has been claimed, the relative unit values show a detachment of Portugal relative to Italy over time, reflected in the declining trend below (Figure 16). This is the result when looking at all the categories embodied in the footwear category (64). However, and as the leather shoes are the most important subcategory for both countries, we apply the same procedure considering exclusively this category of footwear. In the case of leather shoes (category 6403), the aforementioned detachment is even more prominent (Figure 17). In 2000 the values of Portuguese leather shoes were closer to the Italian than in the latest years. So, even though there has been an increase of value in the Portuguese leather shoes over time, this category does not seem to be keeping pace with the Italian ones.

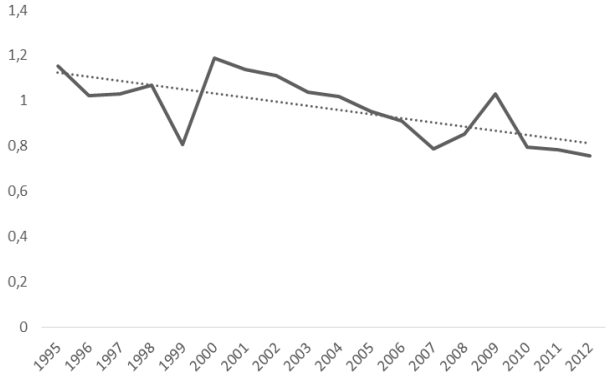


Figure 16: Relative UV of national exports to Italian exports (mean), 1995-2012

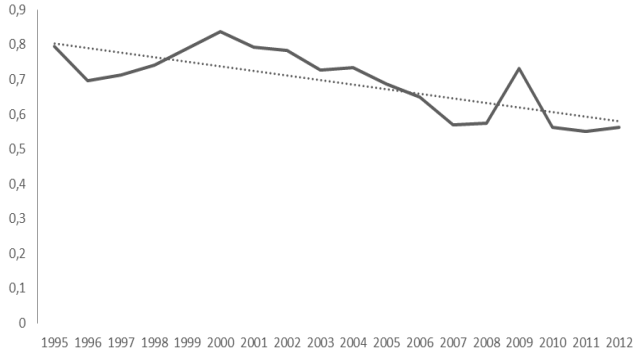


Figure 17: Relative UV of national exports to Italian exports (leather shoes), 1995-2012

Source: UN Comtrade and author's computations

The same kind of comparison was done for the Spanish case (see Figure 18). In this case, the fluctuations registered over time do not suggest a clear trend. However, more recently Portugal seems to be surpassing the values of Spain, presenting overall higher results from 2006 on, even though a considerable drop is identified after 2010 (this happens essentially due to Spanish shoes obtaining higher average unit values results since 2010). Regarding leather shoes (cf. Figure 19), it is more evident that Spain has been continually charging higher prices than Portugal, except for the year of 2008. The results in this case show more clearly the evolution of the relative unit values of Portugal towards Spain, being possible to identify some recovery signs after 2007, when a rising trend is suggested. However, the values of the latest years are lower than those of 1995, seemingly showing no specific increase in quality.

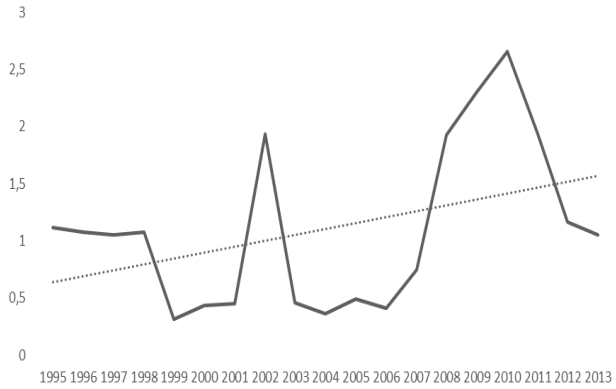


Figure 18: Relative UV of national exports to Spanish exports (mean), 1995-2012

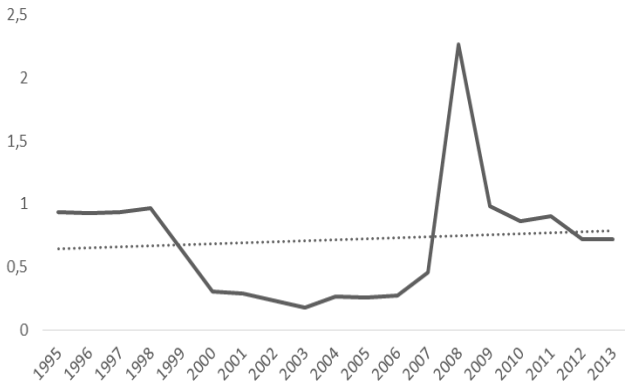


Figure 19: Relative UV of national exports to Spanish exports (leather shoes), 1995-2013

Source: UN Comtrade and author's computations

Along with price comparisons, it is also important to assess to what extent value added in exports stems from domestic or foreign sources. It is not possible to access individually the values for the footwear industry, but the TiVA database provides the aggregate values of the textile and footwear industries from 1995 to 2009.

The results show that domestic value added embodied in exports has been decreasing over time, despite some registered ups and downs. In other words, foreign value added content of gross exports has been increasing, as shown in Table 9.

Table 9: Domestic and foreign value added embodied in exports (Portugal; textile and footwear industries; 1995-2009).

	1995	**2000**	**2005**	**2008**	**2009**
Domestic value added embodied in exports (%)	59.2	52.8	53.5	42.6	42.2

Summing up, we can state that despite the overall increase in value, shown by the evolution of UVs in Portugal, there is no evidence of a significant rise in overall product upgrading when considering its relative/competitive position. Furthermore, it is noteworthy to bear in mind the rising trend regarding foreign value added content of gross exports, which does not count as a sign of improvement or sophistication for this industry.

4.2.2. Product Innovation

Figure 20 presents patent, trademark and industrial design fillings (resident and abroad) in Portugal during the period between 1998 and 2012. Industrial designs seem to be the fastest growing way of protection/innovation over time and patents the slowest, showing a slightly decreasing trend. Apart from furniture, traditional sectors do not commonly apply for patent protection. This kind of protection is mostly used in industries such as pharmaceuticals, civil engineering and biotechnology (WIPO, 2013).

Figure 20: Portugal's Innovation Profile, 1998-2012, Patent, Trademark, industrial designs (growth rate, %)

Source: WIPO

As mentioned earlier, patents are indicators of product innovation of the functional type and are deeply related to product newness. In order to gather the number of patent applications, we used the Portuguese Intellectual Property Database (INPI). Since the search has to be done through textual elements, we have sought by abstract content, taking into account all the results with the words “footwear” and “shoes”. Since 2013, there is a Cooperative Patent Classification System which divides patent applications by symbols (A, B, C, D, E, F, G, H and Y). However, as the process of results harmonization among countries is still in progress, it is safer and easier to use the textual method.

Figure 21 presents the evolution in the number of patent application from 1995 to 2013:

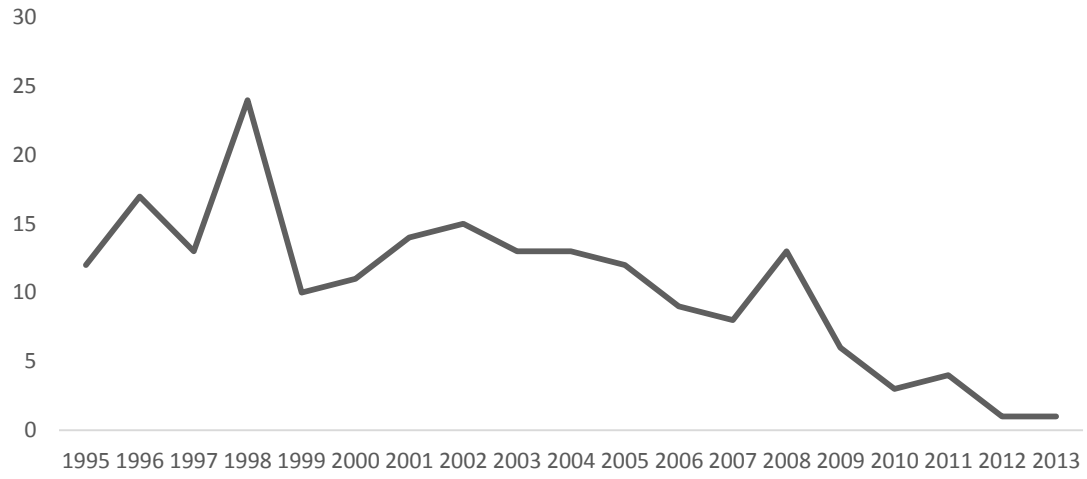


Figure 21: Number of footwear patent applications (Portugal, 1995-2013)
Source: INPI

As stated before, product innovation of the functional type is not very common among low-tech sectors (cf. Section 2). This is undoubtedly the case, since figures are low and have been decreasing over time, with the pace of decrease being intensified after 2008. Patent applications have been diminishing, therefore, no signs of upgrading are shown, according to this indicator.

Taking into account that marketing and aesthetical innovations are more common forms of innovation in LMT industries (Heidenreich, 2009), we have also searched for trademarks and industrial design applications. Starting with the former, we use two different databases of WIPO's global brand database and Romarin database (Madrid System).

Instead of focusing on the worldwide activity, we relied on the origin of the application in order to get a fuller picture of Portugal's footwear industry trademark-related activity. Portugal is part of the third group of origins with the highest level of filling activity which includes three large Latin American countries – Argentina, Brazil and Mexico – along with Australia, Canada, India and a number of European countries – Ireland, Bulgaria and Switzerland (WIPO, 2012). To simplify our data collection, we use solely three elements of search: office of origin, NICE Classification and date of registration.

Many offices use the NCL (NICE Classification) to classify trademark applications into one or more of its 45 classes. Basically, this kind of classification is a way to aggregate similar goods and services, making it easier to obtain tailored results. The

highest ranked classes indicating goods were Class 25 (Clothing, footwear and headgear, with a share of 7%) and Class 9 (which includes scientific, photographic, measuring instruments, recording equipment, computers and software, with a share of 6.7%).

In this case, we focused precisely on category 25, which refers to clothing, footwear and headgear, obtaining the results registered in the Portuguese Office (origin). The results are shown in Figure 22.

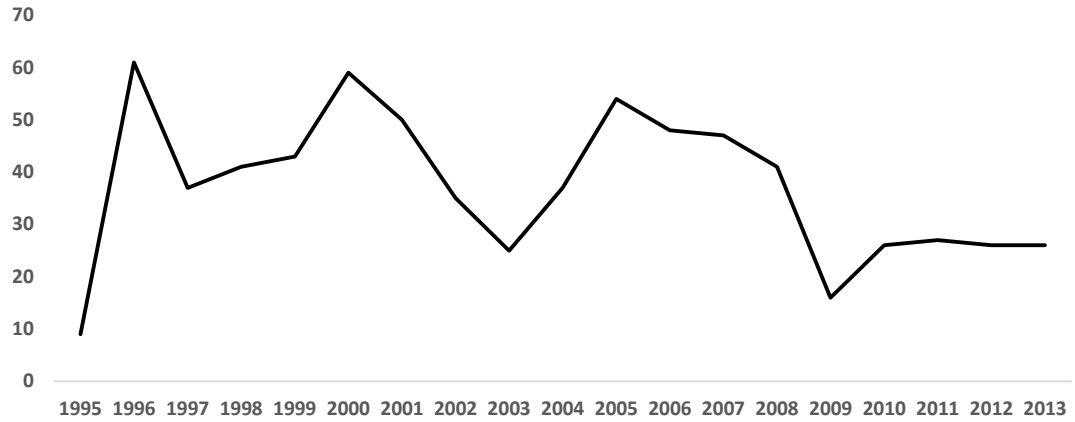


Figure 22: Number of registered Trademarks, 1995-2011

Source: WIPO, Global Brand database

According to our findings, 1996 was the year with more registered trademarks (67), followed by 2000 (59) and 2005 (54). Despite the irregular pattern, there seems to be a decreasing tendency in the number of registrations over time. On average, 35 trademarks were registered per year in the footwear, clothing and headwear class, which is a very low result, meaning that not much effort is being put into marketing and aesthetics.

In order to take into account the number of trademarks currently in force (without searching for the date of registration, but to have a cumulative perspective and to assess the number of active trademarks), we have used also the Romarin database (Madrid System, WIPO)

The WIPO Madrid system permits a multi class registration. This has been one of the most used systems: in 2012, 17 of the top 20 offices received more than half of their trademark filing activity from abroad through designations via the Madrid system, with some IP offices receiving between 71 and 91% of their trademark filing activity from abroad. Although the Madrid system is a multi-class one, a high percentage (44.3%) of all international registrations specified only one class.

Using the WIPO-Romarin database, we have gathered information about all the active trademarks whose origin is in the Portuguese Office and are simultaneously related to the footwear industry (NICE 25).

The results are divided in the following subgroups: exclusive trademarks for footwear; trademarks related to footwear components (included in all the other subgroups); Category 25, which encompasses trademarks in footwear, clothing and headwear; trademarks related to at least two classes (category 25 and another one). The results are presented in Table 10.

Table 10: Trademarks in Force, Portugal

Class of trademark	**Number**	**%**
1.Only footwear	83	22.7
2.Footwear components (included in 1, 3 and 4)	20	5.5
3. Category 25 (footwear, clothing and headgear)	97	26.6
4.At least two categories (25 + another category)	186	50.8
Total	**366**	**100**

Source: WIPO, Romarin (Madrid System)

Our findings reveal that about 80% of the results obtained in the search included the footwear industry. However, only 22.7% of those are solely devoted to footwear. In the majority of the cases, when a trademark is registered, the owner of the brand prefers to broaden the register to other categories. This happens 186 times out of 366 (51% of cases). In fact, there is a vast preference for registering a brand when a multitude of categories are at stake. Also, we have to highlight that, seldom, both category 18 (leather and leather products) and 25 (footwear) are registered together: when this happens, we are most likely talking about footwear production. However, as this cannot be empirically confirmed, we have considered these cases as being part of group 4. In 26.5 % of the cases, the trademarked activity was related to at least two of the components of category 25. Here, we have only considered the combinations where footwear was included, which is the focus of our work.

For comparative purposes, a similar search was done for all of the countries in the top 8. We have also used the WIPO's Global Brand database to compute the results, following the same criteria: date of registration, NICE 25 results and Office of Origin (being the origin each of the countries selected). Since our purpose is to compare the results with those of Portugal, we had to select a measure that would be an indicator of the relative size of the industries involved. As NICE 25 embodies textiles, headgear and footwear, we divided the total number of trademarks found by the Gross Value Added of textile, wearing apparel and leather and related leather products industries.

Table 11: Ratio of trademarks over GVA, million €, (Top 8; 1995-2010, constant 2005 prices)

Countries	**1995**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2013**
Austria	0.0531	0.0950	0.1001	0.0745	0.0953	0.1155	0.1303	0.0902	0.0735
Denmark	1.0018	0.8192	1.3776	1.0391	1.5104	1.3537	1.0972	1.0046	0.9499
France	0.0424	0.0474	0.0576	0.0681	0.0753	0.0776	0.0762	0.0790	0.0892
Germany	0.0546	0.0726	0.0677	0.0779	0.0907	0.0834	0.0810	0.0807	0.0674
Italy	0.0114	0.0148	0.0275	0.0292	0.0299	0.0293	0.0228	0.0267	0.0249
Portugal	**0.0022**	**0.0147**	**0.0161**	**0.0150**	**0.0151**	**0.0137**	**0.0059**	**0.0094**	**0.0094**
Spain	0.0172	0.0134	0.0151	0.0151	0.0141	0.0124	0.0107	0.0097	0.0154
UK	0.0000	0.0080	0.0280	0.0321	0.0323	0.0307	0.0262	0.0350	0.0470

Note: Gross Value Added data used in 2013 regards 2010, since these are the latest available data. In the case of Denmark, use was made of the 2007 GVA.

Source: WIPO's Global brand database/EU KLEMS and author's computations

According to the results described in Table 11, Portugal presents the lowest trademark ratio. In contrast, Denmark, Austria and Germany display the average highest results, respectively. When comparing the results of 1995 to those of 2013, all countries except for Denmark and Spain present an increase that most likely represents an improvement in marketing/aesthetic features. This is clearer in the cases of France and the UK.

This is a good proxy for marketing investment, pointing out that, amongst the top 8 countries, Portugal has been investing relatively less in marketing and aesthetic features than its competitors. On the other hand, Denmark leads the way, possibly adopting a differentiating strategy by innovating aesthetically and in terms of marketing, which can partly explain the bottom positioning of Portugal amongst the top 8.

To assess Industrial Design Applications, we have also selected the Portuguese Database for Intellectual Property (INPI). The search was based on the same procedure as Patent applications'. When it comes to industrial designs, there is an international

classification, established by the Locarno Agreement (1986) as the Locarno Classification. The results obtained for this industry are included in both classes 02-04 (Footwear, socks and stockings) and 02-07 (Clothing accessories), following the aforementioned classification (WIPO, 2013).

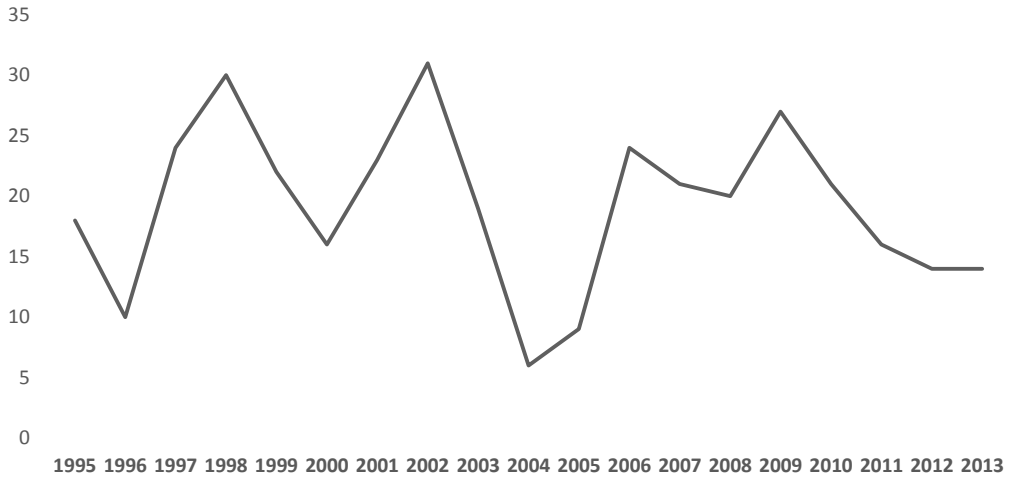


Figure 23: Number of Industrial Design Applications, 1995-2013
Source: INPI

As it happens with trademarks, and perhaps in a more clear way, there is a rather irregular pattern, which nevertheless seems to be consistent with a slightly decreasing trend (cf. Figure 23). The results seem to randomly vary between 6 and 31 applications per year, being 2002 the year with most applications and 2004 the one with least. Once again, no evidence of a recent increase on aesthetical innovation can be identified.

4.2.3. Process innovation and process upgrading

As explained in Section 3, the assessment of process innovation and upgrading is performed by analysing productivity and investments trends over time.

Starting with labour productivity (GVA per hour), a comparison is also undertaken with regard to the top 8 countries. Due to the recent change in the industrial classification scheme used by national statistical agencies from NACE 1 to NACE 2, production and employment data regarding specifically the leather and footwear industry are only available until 2007. Afterwards, the available data put together leather and leather related products with textiles and wearing apparel.

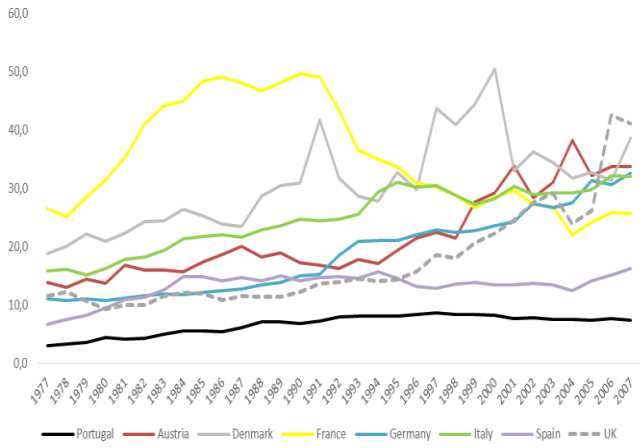


Figure 24: Productivity (GVA/hour) (2005 prices), top 8, leather and footwear industry, 1977-2007

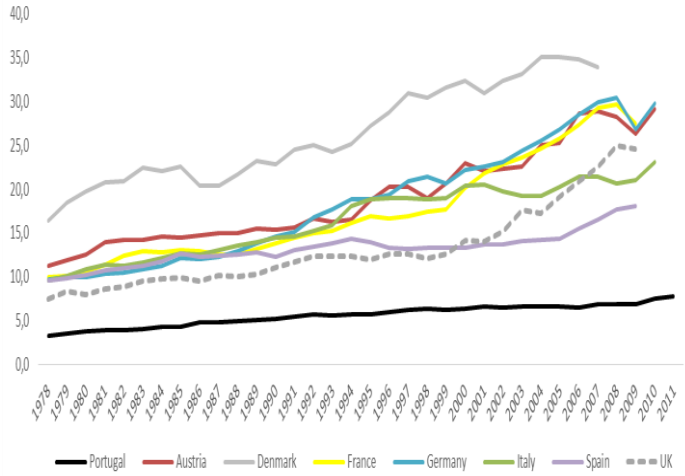


Figure 25: Productivity (GVA/hour) 2005 prices), top 8, textiles, wearing apparel, leather and leather related products industries, 1977-2010

Source: EU KLEMS/INE

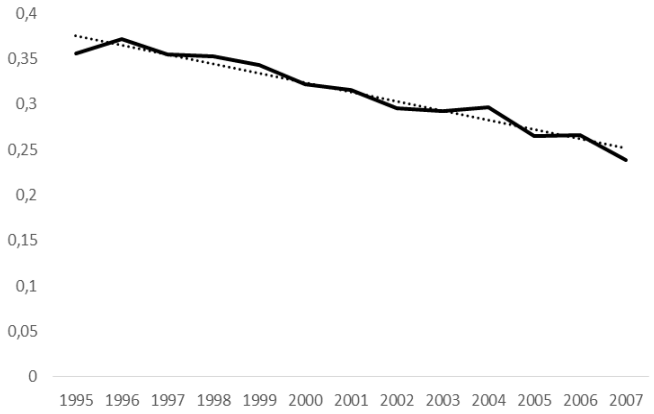


Figure 26: Relative productivity (Portugal/Top 8 mean), leather and footwear, 1990-2007

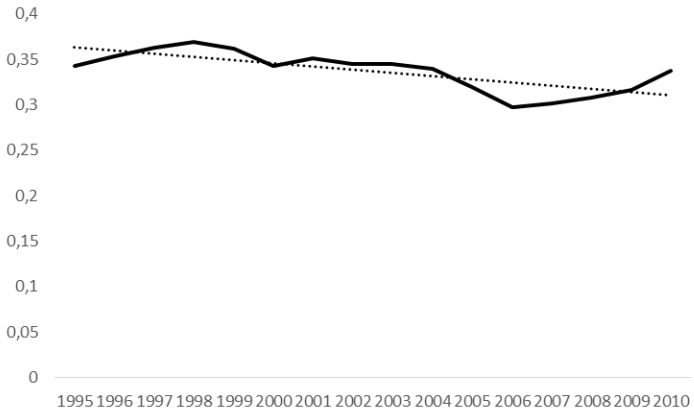


Figure 27: Relative productivity (Portugal/Top 8 mean), textiles, wearing apparel, leather and leather related products industries, 1995-2010

Source: EU KLEMS

According to our results, Portugal is the country amongst the 8 selected, which presents the lowest productivity levels, in both cases (cf. Figures 24 and 25). When it comes to the leather and footwear industry, Portuguese results are slightly higher, but not significantly different from the ones obtained when considering simultaneously the other industries. Also, we cannot confirm the existence of a rising trend, when actually, results from the late 90's onwards suggest a situation of relative stagnation.

Regarding the leather and footwear industry, France is the country in which productivity levels have been dropping drastically, having recovered slowly after 2004. In contrast, UK is the country where a massive improvement is found, being the one with highest results from 2005 on. In the case of Austria and Germany it is possible to identify a clear rising trend over time, despite some regular ups and downs. Italy, as its turn, has been maintaining a steady position since 1995. Denmark shows a very irregular evolution trend, still, the latest results are higher than the ones obtained in 1990. Nonetheless, it is important to bear in mind that productivity can also be related to the type of footwear produced, therefore, it is important to guarantee that the established comparison is fair at this point, which it seems to be, since all of these countries preferentially export leather shoes.

Figure 25 shows a slightly increasing productivity trend in Portugal, but which does not allow for convergence relative to the other countries. In contrast, Denmark shows the highest productivity levels during the whole period. Overall, all countries except for Portugal present a clearly improving tendency, especially after the mid 90's. Italy has experienced some fluctuations but has shown some recovery signs after 2008. Countries such as Germany, France and Austria have clearly felt the impact of the 2009 crisis, immediately regaining value the next year.

To assess whether or not Portugal is keeping up with its top competitors (even though we can pretty much confirm already it is not), we have decided to set up a relative productivity measure, similarly to what was done for the unit values. We have defined a "top 8 average productivity" for both leather and footwear (cf. Figure 26) and the textiles, wearing apparel, leather and leather related products industries (cf. Figure 27). The average productivity levels were obtained by a weighted average, with weights defined according to countries' contribution to overall Gross Value Added. Concerning the leather and footwear industry (Figure 26), a stiff and continuous decreasing trend is obtained. Judging by the results found, Portugal is clearly behind the other top

competitors, increasing its detachment over time. In the case of NACE 2 classification "textiles, wearing apparel, leather and leather related products industries" (Figure 27), a decreasing trend is also detected, although less severe, suggesting some recovering signs after the low peak of 2006.

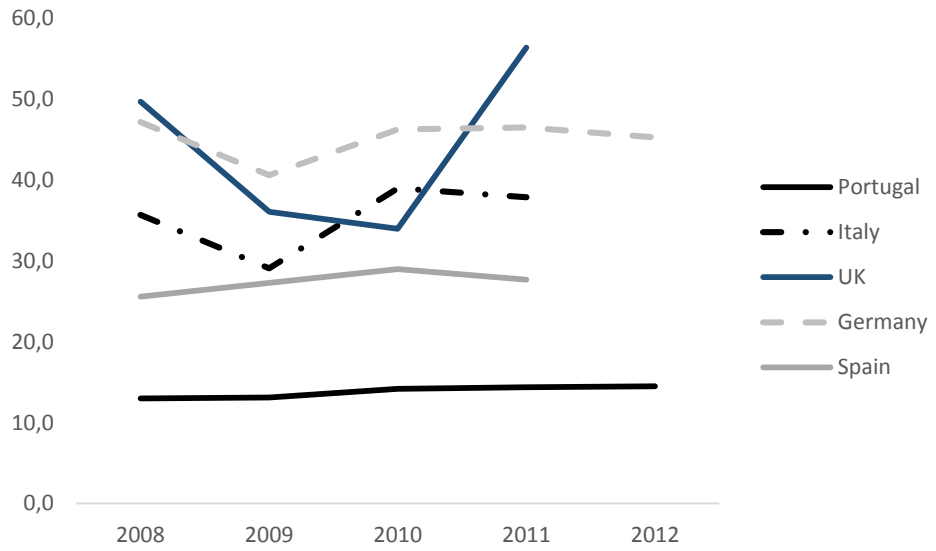


Figure 28: Productivity (GVA per employee), footwear, (Portugal, Italy, Germany, Spain and UK), 2008-2012.

Source: Eurostat

Selecting another database, we were able to find updated results for the sole footwear sector, between 2008 and 2012 for some countries. Among the 5 countries depicted in figure 28, Portugal is, consistently, the one with the lowest results, evidencing a slightly increasing trend, remaining still extremely below the productivity levels of the other direct competitors.

Summing up, there is no evidence of improvement when it comes to analysing the Portuguese leather and footwear industry productivity changes. In fact, it lies constantly behind the other top competitors, with a divergence pattern being found over time.

Another feature to consider within this category of innovation/upgrading relates to the investment in tangible and intangible assets, which may be essential to change the production practices and reflect the propensity to innovate in supplier dominated firms. As stated previously, in sectors such as the footwear industry, in-house technology is very rare and the pace of innovation is basically dictated by machinery and software acquisitions from equipment suppliers (cf. Section 3.2.2.). In these circumstances, a key

indicator for the analysis of the intensity of innovation may be related to the acquisition of machinery and equipment and the development of software.

The Portuguese Statistical Office (INE) provides information on GFCF and its decomposition in several assets at the industry level. GFCF evolution (cf. Figure 29) shows a stiff decrease up until 2006, moment when a boost in investment is detected; even though there is a significant drop in 2008, the following years show an ongoing increasing trend. However, we should not get too optimistic towards the most recent results, since they are still below the ones obtained in 2000.

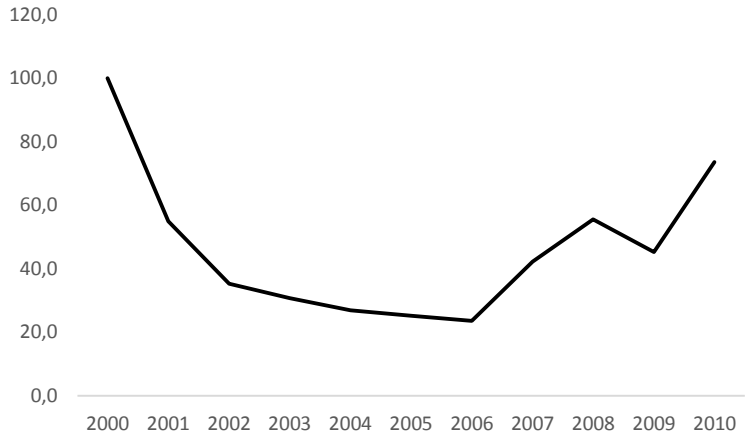


Figure 29: GFCF, leather and leather products, volume index (Portugal, 2000-2011, 2000=100)
Source: INE and authors' computations

Figure 30 presents the decomposition of total GFCF across assets. Software and intangible assets are of minor relevance, barely changing over time; in their turn, machinery and equipment investments follow the same trend as the general GFCF results, meaning that results from the last years are more encouraging and evidence an upward trend.

Evidence found does not seem to be indicative of new means of producing shoes being widely spread in this sector, or even at stake in the Portuguese case. Nonetheless, a recovery was detected in terms of capital investment, which may be a starting point for process innovation that still needs to be promoted in this sector, especially when it comes to intangible assets.

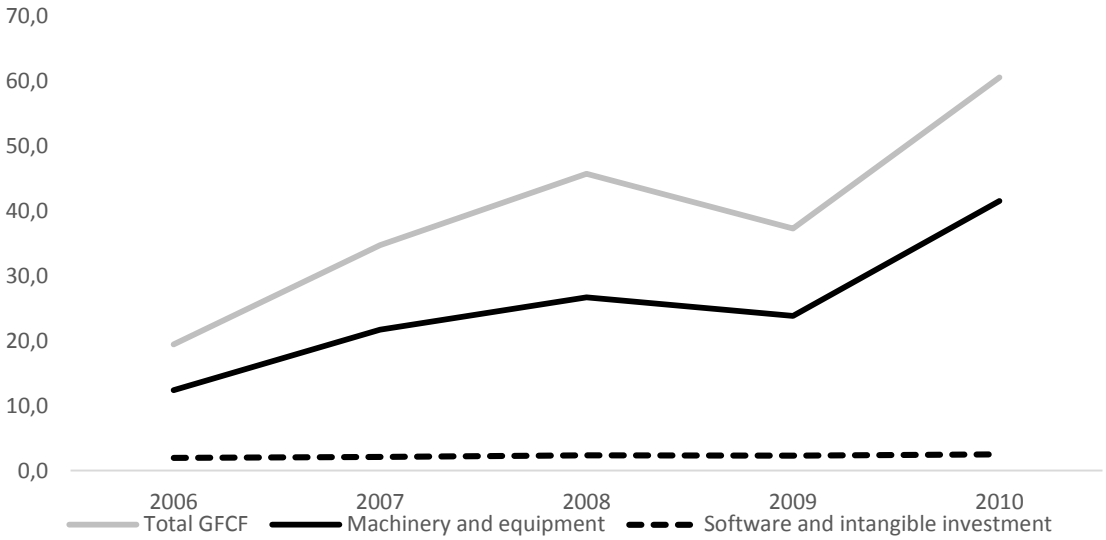


Figure 30: Machinery and equipment, Software and intangible investment, leather and leather products, volume index (Portugal, 2006-2010, 2006=100).

Source: INE

Since there was no available data for the rest of the top 8 countries relative to the leather and footwear industry, we will use the results from the textile, leather and footwear industries to establish a comparison.

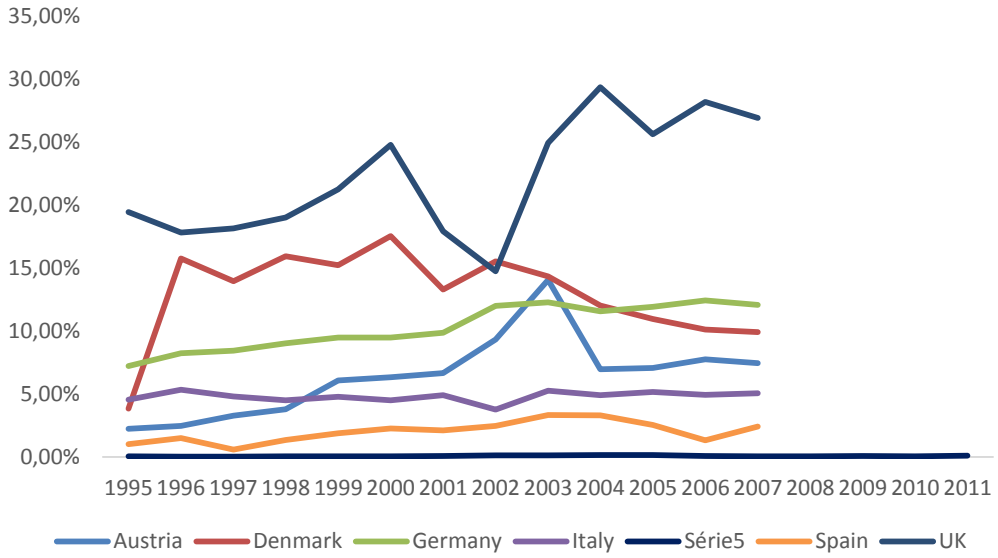


Figure 31: Software and intangible assets investment (% over total GFCF), Textiles, leather and footwear industry, (Top 8 minus France[17], 1995-2011, 2005 prices)

Source: EU KLEMS/INE and authors' computations

[17] Results for France were confidential and, therefore, not available at the EU KLEMS database.

Figure 31 presents the percent of software and intangible assets investment over total GFCF. All countries show the same overall trend: the proportion of software and intangible assets increasing. The UK is also the country which presents the highest proportion of investment in software and tangible assets, followed (although not closely) by Germany and Denmark.

In the case of Portugal, we found available data until 2011, having a more updated picture on this feature: Portugal is the sole case where this proportion barely changed over time, with investment in software and intangible assets being the lowest (and close to zero, in terms of proportion) amongst this set of countries. Portugal still barely invests in software and intangible assets, presenting only residual values and staying consistently behind the other top competitors.

4.2.4. Organisational innovation and functional upgrading

As referred before, human resources can also be taken into account when measuring innovation (Mendonça, 2013). In the literature, higher wages are often correlated with the ability of producing new differentiated goods and of developing the most sophisticated production processes (Cismas *et al.*, 2011; Schwab, 2013).

It is hard to distinguish whether to consider this indicator in the process or organisational innovation/upgrading sections. In this case, we have decided to include the wage evolution analysis in this section because higher wages are likely to reflect the acquisition of new well paid functions (or the abandonment of not efficient ones).

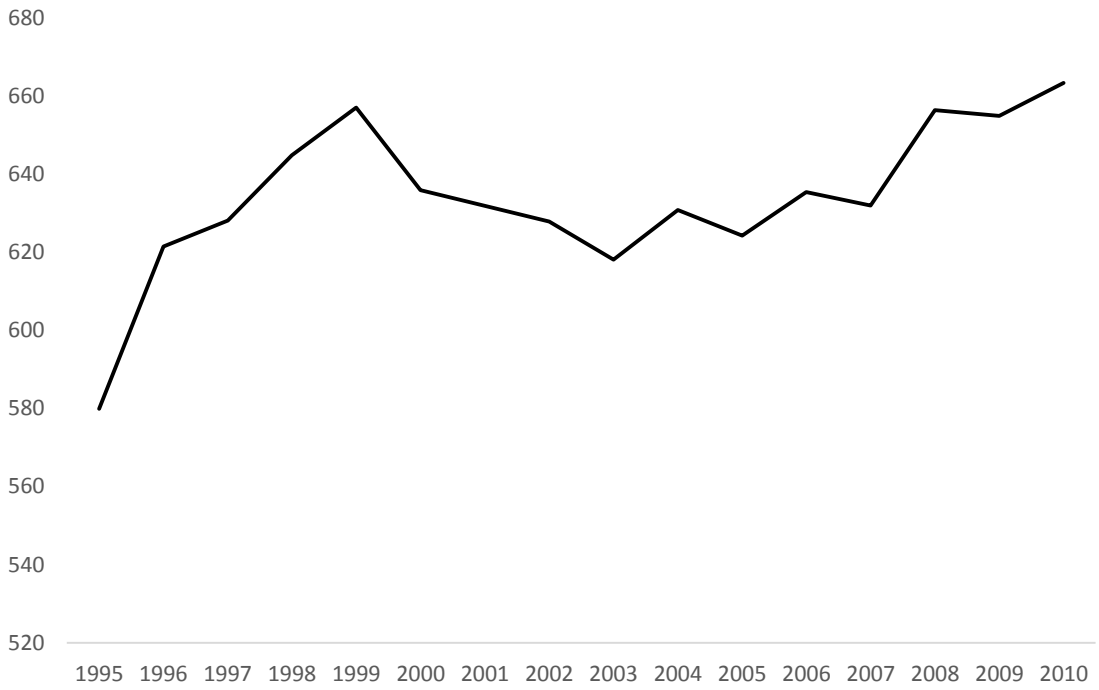
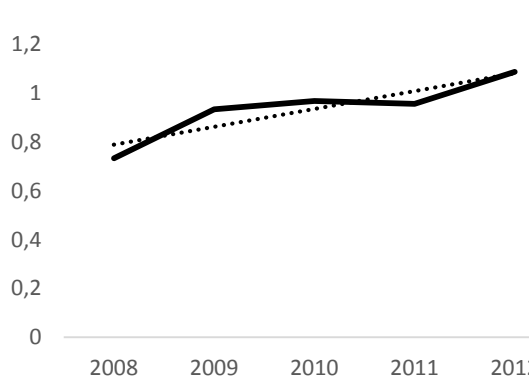


Figure 32: Wages and salaries (constant 2000 prices) per employee, Portugal, leather and leather products, 1995-2010

Source: INE

As shown in figure 32 and despite the fluctuations observed, a general rising trend is detected, more evidently after 2003. However, an average salary of about 663€ which is the value obtained in 2010, is not exactly what we would call evidence on industrial upgrading: firstly, the result itself is relatively low and, secondly, it is very similar to the average wage of 1999 (657€). So, even though it is possible to identify an ongoing rising trend after 2003, it is not indicative of upgrading, but rather a sign of recovery (note the

steady fall between1999-2003). The overall results remain considerably low, showing no signs of upgrading.



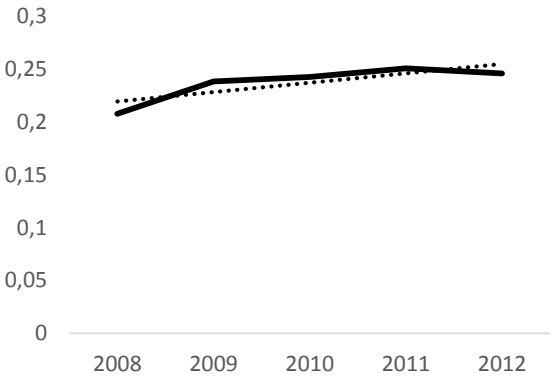


Figure 33: Relative wages and salaries (Portugal/ Spain), footwear, 2008-2012.

Figure 34: Relative wages and salaries (Portugal/Italy), footwear, 2008-2012.

Source: Eurostat and author's computations

Figures 33 and 34 also depict an increase when considering the relative wages and salaries of Portugal to Spain and Italy, respectively. This increase is, though, more pronounced in the Spanish case: in 2012 Portuguese salaries proved to be higher than the Spanish ones, evidencing the referred upward trend. When compared to Italian wages, the Portuguese are still tremendously low; it is true, however, that a very slight increase is found over time, followed by a drop in 2012.

Complementarily and for comparison purposes, we rely on labour compensation indicators. Figures 35 to 37 show the shares of high/medium/low skilled persons engaged in total hours worked: this helps understand the sectoral composition in terms of employees' qualifications. An increase in the shares of hours worked by high skilled persons engaged is a good indicator of functional upgrading; also, the highest shares show the predominance of a certain type of labour qualification.

The Portuguese results clearly show the predominance of hours worked by low-skilled employees, accounting for more than 80% of the total results. Portugal is, in fact, the country with the highest shares in hours worked by low-skilled workers, even though after 1999 a slightly decreasing trend is detected. The shares of medium and high-skilled workers are very low, though a rising trend is identified from 1998 on in the case of high-skilled labour. As the predominance of low-skilled workers is smashing relative to the other categories, it is clear that the sector is still very focused on unqualified human resources.

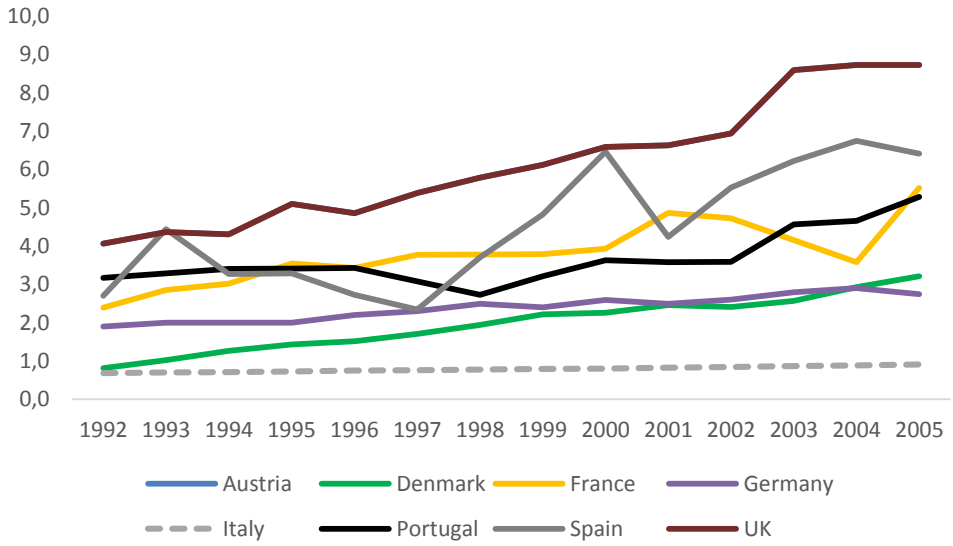


Figure 35: High skilled persons engaged in total hours worked (%), textile, leather and footwear, Top 8 (1992-2005).
Source: EU KLEMS

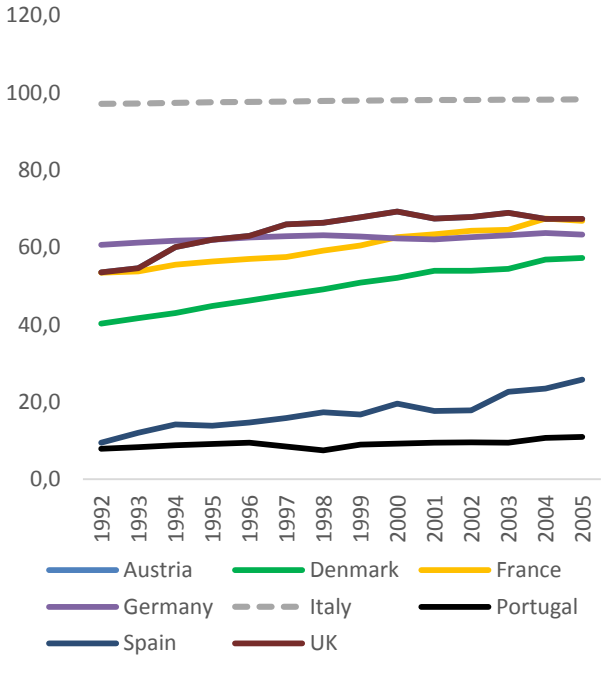


Figure 36: Medium skilled persons engaged in total hours worked (%), textile, leather and footwear, Top 8 (1992-2005)

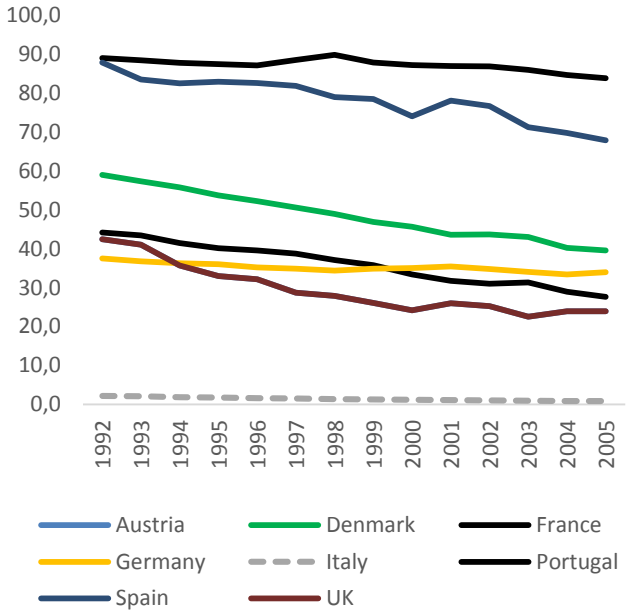


Figure 37: Low skilled persons engaged in total hours worked (%), textile, leather and footwear, Top 8 (1992-2005)

Source: EU KLEMS

On the other hand, Italy, for instance, presents a neat prevalence of hours worked by medium-skilled workers, with basically no relevance in the low-skilled labour category. Also, the composition of Italian's shares has barely changed since 1992.

The UK is the country where the highest shares in hours worked by high-skilled persons engaged are found, presenting a rising trend in both the high and medium categories.

The majority of the countries show a predominance in the medium-skilled category: Italy, UK, Germany, France and Denmark, respectively. Only Portugal and Spain are linked to a dominant low-skilled category, with Spain being able to decrease its share over time.

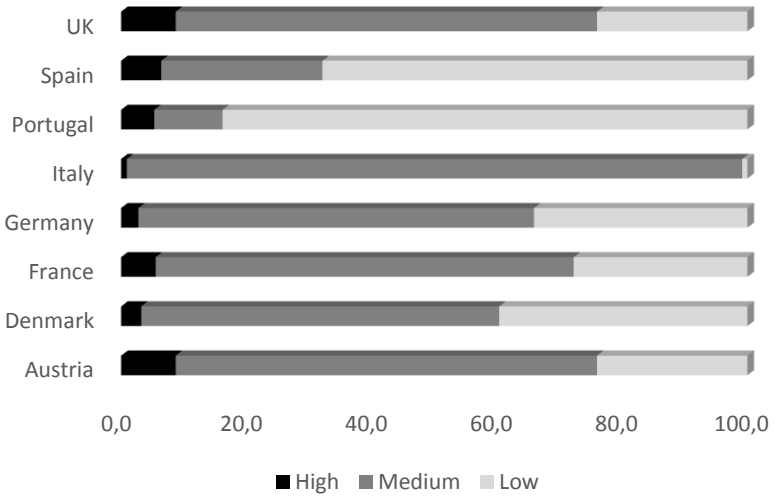


Figure 38: High, medium and low skilled persons engaged in total hours worked (%), textile, leather and footwear, Top 8, 2005.

Source: EU KLEMS

Figure 38 gives an overall perspective on the qualification composition of the textile, leather and footwear sectors in each top 8 country in 2005 (the most recent obtained data). It becomes clearer by observing this figure that Portugal is the country with the highest share of hours worked by low-skilled workers, just as Italy is by far the one which is basically solely composed by medium-skilled workers, as stated previously.

5. Conclusion: challenges, results overview and final remarks

Getting back to our starting point, increasing globalisation and more intertwined production practices have been altering the basis of competitiveness (Freeman, 2008). Under this new environment, the major threat faced by developed economies concerning new competitors (e.g., emerging economies) lies in the fact that they have lower absolute costs, as well as lower unit labour costs. Moreover, a shift in the production location has been in place, and some authors have been pointing out that the overall value added in the advanced economies did not increase over the 1995-2008 period (Timmer *et al*., 2013). The arising competition from the so called "low cost competitors" contributed to either stagnation or a changing pattern of production in the most developed ones, being known for a fact that China and other emerging economies accelerated the erosion of mature economies' comparative advantage in labour-intensive production tasks, leaving only one option left: quality competition (Aiginger, 2000; Timmer *et al.*, 2013).

However, the rise of emerging economies does not have to necessarily mean the abandonment of mature industries by the part of developed countries. Even though there may be an overlap in terms of some export goods, in many cases the market segments are not the same. International trade prices are split in different price categories (e.g., low, medium, high); this division shows that producing the same category of products (or having a similar export mix) does not necessarily mean direct competition, for countries may be producing a commodity that might be inserted in a different segment (Schott, 2008). Besides, countries at different development levels usually sell differentiated varieties of the same products, at very different prices (Fontagné *et al.*, 2008).

We have verified this ourselves while computing the exports unit values per category of commodity in each country. That is why, for instance, China figures in the top 20 but it doesn't in the top 8: when selecting the countries with the highest UV, China is clearly out; however, this is the country with the highest footwear exports share around the globe nowadays, meaning that this value comes from massively exporting low priced goods. This is consistent with Schott's (2009) and Fontagné's *et al.* (2008) findings. We might add, though, that it is also possible to find different price segments within the same country, depending on the category considered (prices are likely to differ from category to category, which makes it necessary to establish comparisons in order to obtain fruitful insights on its price segmentation).

Our main research question had to with Portugal being able (or not) to keep up with its direct competitors and innovate in this fierce competitive environment, taking into account the evolution of a traditional manufacture: the portuguese footwear sector. It is clear that Portugal had its weaknesses exposed with the global crisis, having felt the consequences of unsustainable external imbalances (OECD, 2013). It is seen by some authors (Godinho *et al*, 2014) as a "stuck in the middle" case: while insufficiently developed to compete in the most sophisticated markets, the price of its products in the international markets proved to be too high to compete with those of less advanced emerging economies. Portugal's competitiveness problems have deeper roots that cannot go unnoticed: the overspecialization of Portuguese manufacturing industry in activities with low value added and low technological intensity were the main focus until 1999. Lately, as a reaction to the competitive pressure and overlapping export mixes, there seems to be a more concerned attitude towards R&D, innovation and internationalization. More recent efforts have been contibuting to relevant improvements in the quality of products and the integration of Portuguese firms in the international markets (Godinho *et al.*, 2014).

Moreover, in this year's competitiveness rankings, Portugal occupies the 46th place, which is the worst position it has ever conquered (IMD, 2013; Schwab, 2013), being, however, consistent with OECD's statements that affirm it has been continually losing competitiveness (OECD, 2013). Also, Portugal has one of the highest exposure index levels in Europe, only surpassed by Greece. The exposure index measures jobs exposure to global competition: it means the higher the levels are, the more jobs are at risk, therefore Portuguese workers are likely to loose more jobs as competition increases. This happens essentially due to the prevalence of unskilled labour or very poor organisational practices.[18] However, the World Economic Forum already considers Portugal one of the innovation-driven countries, which is not that surprising, since China and other BRICs are now efficiency-driven countries (Schwab, 2013).

Even though facing fierce competition, Portugal is considered to be a case success regarding the footwear industry. Bearing this in mind, an attempt has been made to empirically assess if there has been a significant rise in value concerning portuguese footwear (while comparing the portuguese performance to other top footwear exporters); and secondly, to attest if a potential increase in value is articulated with innovative

[18] According to Lundvall and Lorenz (2009), Taylorist forms of production are still pronounced.

strategies. To assess both upgrading and innovation, we have established a set of comprehensive metrics regarding product, process and organisational features.

Table 12 shows a summary of findings, presenting each indicator and its function, followed by the observed trend during the last decade.

Table 12: Summary of findings

Measures	Indicator	Trend
General indicators for product quality upgrading	UV	General rise
	Relative UV- top 20	Barely changed
	Relative UV- top 8	Barely changed
Product innovation (functionality)	Patents	General decrease
Product innovation (Marketing and Aesthetical features)	Trademarks	Great variation over time/decrease – low investment levels
	Industrial Designs	Decrease during the last years
Process Upgrading	GFCF/ Machinery /Software Acquisition	Rising trend after 2009/ but with levels similar to the beginning of the period. No significant increases in software/ other intangible investment
	Productivity	Barely changed - low
Organisational Innovation and Functional Upgrading	Wage	Overall increase (after 2003) – still low
	% of hours worked per level of qualification	The country with the highest shares in the low-skillcategory

Based on Table 12, we can state that besides a general increase in exports unit values, (following closely direct competitors' trends), no other feature shows any consistent signs of improvement. Product innovation features, for instance, emphasize a downward trend, suggesting low levels of investment towards functional and marketing/aesthetical innovations. Productivity levels are still very low and, when a comparison is established, Portugal lies consistently behind its competitors. When it comes to investment, even though a rise is suggested after 2009, no changes are found in terms of its composition, namely in a potential reinforcement of software and intangible

assets investment, as happens with some of Portugal's direct competitors. In fact, the proportion of this category of investment in total GFCF is the lowest among countries, almost insignificant, and did not change over time.

When it comes to general product quality upgrading, and even though an increasing trend is detected in exports unit values, when the results are computed relatively to the weighed exports unit values mean of the top 20 or 8, it is shown that the Portuguese positioning barely changed since 1995. There are some signs of recovery after 2009, but they are not as expressive as required to state confidently that the sector has upgraded, especially when industry figures stay close or even bellow 1995 results. After 2009, results are a bit more encouraging, but do they occur due to an increasing worldwide recognition of Portuguese footwear quality? A simple correlation calculus seems to suggest otherwise: the Pearson correlation coefficient between the rate of change in export volume and average footwear UV is negative (-0.469) and statistically significant at the 5% level (two-tailed), meaning that the recent increase found in exports does not denote an increase in their quality, according to this indicator.

Besides, changes found in UV do not seem to be related to the innovation factors usually referred in the literature as important sources of innovation in low-tech industries. According to our findings (Table 13), there is a (significant) negative relationship between both trademarks and the proportion of high-skill labour with relative UVs, whereas the correlation between UVs and industrial designs is not significant, which seems to indicate that an effective case of upgrading is not at stake: the positive results obtained for the unit values are not accompanied by an improvement regarding marketing, aesthetical features or other organization related innovation features.

Table 13: Correlation matrix of the dimensions under analysis

	Relative UV (top 8)	Trademarks	Industrial designs	Patents	%of high skilled labour
Relative UV (top 8)	1.00				
Trademarks	-0.53**	1.00			
Industrial designs	0.22	-0.18	1.00		
Patents	-0.23	0.43*	0.24	1.00	
%of high skilled labour	-0.23	0.05	-0.67**	-0.42	1.00

Notes: N = x;**, * Correlation is significant at the 0.01 and 0.05 levels, respectively (two-tailed test).

Moreover, it is worth recalling some other aspects indicated earlier that corroborate the general impression of slow upgrading. For instance, overall productivity levels are too low, even when comparing the Portuguese case to other quality competitors (i.e., competitors which take longer to produce high quality shoes, producing less per hour). This might have to do with lack of managerial and organisational resources and skills, or the existence of firm practices and habits that have been kept over time and are now obsolete, as stated before by Lundvall and Lorenz (2009).

Furthermore, the vulnerabilities of the industry may be related to the general performance of the cluster in which it is integrated. Is it anchored on strong and innovative support industries? Are suppliers contributing effectively to its development? Given the focus of our work, we cannot confirm either of these hypotheses. One stimulating complementary approach to this study would thus consist in examine the strengths and weaknesses of the footwear cluster at the regional level and establish strategic patterns of development, involving both support and supplier industries, to leverage its competitive performance.

To sum up, the results found do not evidence a clear industrial upgrading pattern. However, this does not mean that prominent cases of success regarding Portuguese footwear are absent. It is too far-fetched, though, to admit this applies to the whole sector, which according to the available data is changing rather slowly. For that reason, it would be interesting to cross the sectoral results found in this study with other micro analysis, supported by specific firm-wise technology and innovation data available at Eurostat's Community Innovation Surveys, for instance, and which could make more visible the differences between the most innovative and successful firms and the laggards. An interesting complementary analysis would be also to assess the role played by of economic policy in the performance of the industry. European Commission (2010b)

admits that the crisis has shifted the focus of industrial competitiveness from long-term sustainability to short-term recovery measures, acknowledging it was time now to refocus on long term structural challenges (European Commission, 2010b). The question is: to what extent are these policies being effective when the same problems remain or barely change? More recently, three factors were pointed out as critical (and yet to be improved) to the sustainability of EU industrial competitiveness: business environment, since progress remains uneven which holds back growth, especially in "stuck in the middle" countries, like Portugal; investment in research and innovation, which remains too low, as proven by our results; and access to production inputs – for instance, energy prices are higher for the EU countries than for the emerging ones (European Commission, 2014).

What is the way to go, then? First of all, as our view on competitiveness is based on sustainability principles, we must not forget social cohesion. As verified before, the number of firms and employees in the footwear sector steadily dropped until 2010 and wages are still very low (cf. Section 4). Without social investment and institutional reforms, it is not possible to enhance competitiveness the way Lisbon 2020 strategy aims to (European Commission, 2013). It seems, therefore, that some structural changes are at stake. OECD offers some insights on this subject that are both relevant and in line with our view on competitiveness and quality competition: upgrading human capital through educational reforms and occupational training systems, as well as sophisticating the functioning of the labour market; expanding Portugal's involvement in international trade, requiring a stronger participation in global value chains to obtain simultaneously higher productivity levels and value added in the industrial sector (OECD, 2013). This strategy, more than filling the lack of social cohesion gap, must be based on learning/knowledge, productivity growth, quality upgrading, agglomeration and fragmentation effeciency and innovation.

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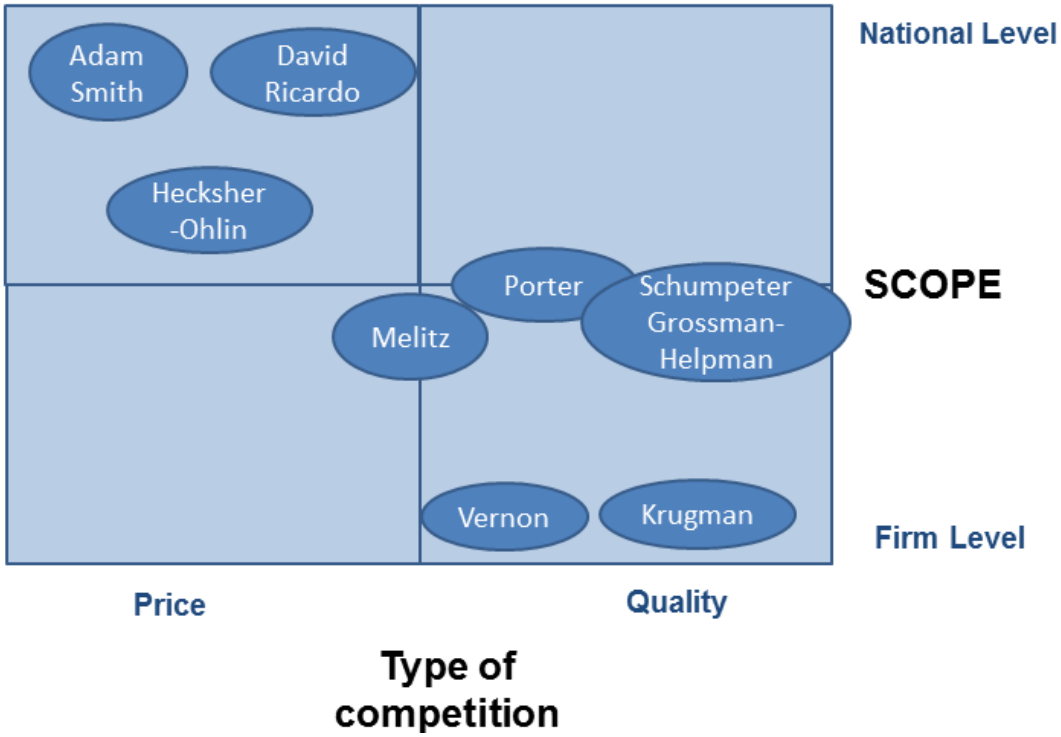
ANNEXES

Figure A.1.: Scope-type of competition relatedness scheme



Source: Made by the author

Table A.2.: Export shares (value), 1995-2012, for the 20 top footwear exporters (%)

Year	Austria	Belgium	Brazil	China	Denmark	France	Germany	Hong Kong	India	Indonesia	Italy	Netherlands
1995	1.3		3.4	15.1	0.5	2.6	3.3	17.7	1.4	4.7	18.4	1.3
1996	1.2		3.5	15.2	0.5	2.3	3.0	18.0	1.2	4.7	19.2	1.2
1997	1.2		3.4	18.3		2.2	3.0	18.2	1.2	3.3	17.4	1.2
1998	1.3		3.2	19.1	0.6	2.4	3.3	15.3	1.3	2.8	17.7	1.4
1999	1.2	3.4	3.1	20.1	0.7	2.4	3.3	14.3	1.4	3.7	16.9	1.6
2000	1.2	3.1	3.5	21.5	0.6	2.0	2.9	14.2	1.4	3.7	15.6	1.7
2001	1.3	3.5	3.6	21.6	0.4	2.1	3.0	12.7	1.4	3.2	16.2	1.9
2002	1.2	3.9	3.2	23.1	0.7	2.2	3.5	12.0	1.3	2.4	15.8	1.6
2003	1,2	3.5	3.0	24.1	0.7	2.4	3.5	10.7	1.3	2.2	15,8	2.1
2004	1.3	3.7	3.2	25.4	0.8	2.5	3.8	9.5	1.4	2.2	1.6	2.3
2005	1.2	3.8	3.0	28.9	0.7	2.3	3.8	9.3	1.6	2.2	13.9	2.3
2006	1.1	4.0	2.9	29.7	0.8	2.3	3.9	8,2	1.6	2.2	13.4	2.2
2007	0.9	4.1	2.5	30.8	0.8	2.4	4.0	7.2	1.7	2.0	13.4	2.2
2008	0.9	4.0	2.2	32.6	0,8	2.4	4.3	6.6	1.7	2.1	12.6	2.5
2009	0.9	4.3	1.8	34.3	0.8	2.3	4.5	5.8	1.8	2.1	11.3	2.8
2010	0.8	3.9	1.7	37.2	0.7	2.2	4.1	5.8	1.7	2.6	10.3	2.6
2011	0.9	3.7	1.3	37.0	0.6	2.3	4.6	5.0	1.9	2.9	10.3	2.9
2012	0.7	3.8	1.1	41.1	0.6	2.3	4.1	4.5	1.7	3.1	9.5	2.7

Year	Portugal	Romania	Slovakia	Spain	Thailand	UK	USA	Viet Nam	Total
1995	4.2	1.0	0.3	4.5	4.9	1.8	1.8		88.6
1996	4.0	1.1	0.3	4.4	2.8	2.0	1.9		86.3
1997	3.9	1.2	0.4	4.8	2.4	2.1	2.0		86.0
1998	3.9	1.4	0.4	5.0	2.1	2.0	1.9		85.1
1999	3.9	1.6	0.4	4.6	2.0	2.0	1.9		88.7
2000	3.2	1.7	0.5	4.1	1.8	1.7	1.9	3.2	89.5
2001	3.3	2.1	0.5	4.3	1.8	1.5	1.7	3.5	89.5
2002	3.1	2.4	0.6	4.4	1.6	1.4	1.5	4.0	89.7
2003	3.0	2.7	0.8	4.3	1.5	1.3	1.3	4.3	89.7
2004	2.8	2.5	0.8	3.9	1.3	1.4	1.1	4.6	89.8
2005	2.4	2.4	0.7	3.3	1.4	1.3	1.1	4.7	90.4
2006	2.2	2.3	0.7	3.6	1.3	1.3	1.1	5.0	89.1
2007	2.2	2.2	0.8	3.2	1.2	1.3	1.1	5.0	88.9
2008	2.2	1.9	1.0	3.1	1.1	1.3	1.1	5.3	89.5
2009	2.1	1.7	1.0	3.2	1.0	1.4	1.2	5.1	89.5
2010	1.9	1.5	1.0	2.7	0.9	1.4	1.2	5.5	89.5
2011	1.9	1.6	1.2	2.6	0.8	1.3	1.1	6.0	89.9
2012	1.9	1.4	0.9	2.4	0.7	1.4	1.2	6.6	91.6

Source: UN Comtrade and author's computations

Table A.3.: Value export shares in leather shoes, top 20, 1995-2013

Countries	1995	2000	2001	2002	2004	2005	2006	2008	2009	2010	2011	2012	2013
Austria	0.52	0.49	0.46	0.43	0.40	0.42	0.42	0.41	0.43	0.43	0.44	0.48	
Belgium		0.50	0.27		0.24	0.27	0.35	0.51	0.33	0.23	0.34		
Brazil	0.82	0.76	0.73	0.75	0.62	0.60	0.56	0.41	0.39	0.32	0.27	0.22	0.21
China		0.21	0.13	0.00	0.24	0.24	0.23	0.31	0.18	0.17	0.17	0.15	
Denmark	0.77	0.59	0.50	0.76	0.68	0.72	0.67	0.74	0.65	0.51	0.49	0.53	
France	0.32	0.37	0.34	0.38	0.35	0.38	0.46	0.68	0.48	0.36	0.35	0.00	0.30
Germany	0.50	0.47	0.47	0.51	0.50	0.43	0.48	0.42	0.40	0.37	0.38	0.37	
Hong Kong		0.14	0.06	0.10	0.05	0.05	0.05			0.11	0.13		
India		0.51	0.50	0.00	0.56	0.63	0.66		0.62	0.65	0.62	0.59	
Indonesia	6403.00	0.54	0.50	0.50	0.55	0.58	0.61	0.67	0.66	0.61	0.62	0.62	0.58
Italy	0.48	0.45	0.45	0.45	0.42	0.43	0.42	0.44	0.43	0.40	0.40	0.45	
Netherlands	0.38	0.67	0.49	0.00	0.42	0.51	0.53	0.88	0.55	0.41	0.42	0.42	
Portugal	0.82	0.78	0.78	0.77	0.71	0.72	0.70	0.77	0.70	0.66	0.65	0.69	0.69
Romania	0.57	0.47	0.49	0.49	0.49	0.51	0.53	0.52	0.50	0.43	0.45	0.49	
Slovakia	0.42	0.48	0.50	0.55	0.52	0.49	0.63	0.62	0.50	0.47	0.50	0.53	0.44
Spain	0.63	0.00	0.44	0.00	0.35	0.32	0.36	0.69	0.23	0.16	0.21	0.30	0.33
Thailand	0.00	0.40	0.18	0.39	0.38	0.44	0.48	0.75	0.47	0.43	0.39	0.00	
UK	0.58	0.58	0.72	0.65	0.56	0.60	0.56	0.53	0.53	0.51	0.38	0.25	
USA		0.50	0.48	0.44	0.40	0.46	0.42			0.31	0.30	0.25	0.26

Source: UN Comtrade and author's computations

Table A.4.: Top Exporters Average UV per year and Top Exporter's UV mean, 1995-2013.

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Austria	36.9	34.1	30.6	30.9	29.7	24.4	23.6	25.1	26.3	27.6	24.5	28.9	37.64	42.08	41.07	40.56	45.34	48.39
Belgium					8.1	16.7	15.6	13.2	17.4	19.8	19.6	20.3	39.24	36.60	31.15	50.73	29.81	16.27
Brazil	18.0	18.6	17.4	16.3	14.2	14.3	14.5	14.2	13.9	15.4	17.9	19.3	20.89	23.12	22.31	22.29	24.22	22.03
China	6.2	7.0	6.2	4.7	3.9	20.1	208	11.3	14.1	16.5	16.5	16.0	16.86	18.89	7.28	7.74	9.27	10.47
Denmark	33.5	31.4		25.5	14.2	39.5	39.4	26.5	31.8	35.0	33.9	91.6	45.74	41.70	37.27	40.93	40.80	41.65
France	22.2	21.8	18.9	19.6	16.7	17.1	17.7	19.4	25.8	29.6	30.8	21.1	27.85	32.73	34.52	30.39	28.56	18.34
Germany	27.2	26.7	23.5	23.9	22.8	20.9	21.3	24.5	28.7	29.8	23.8	28.4	32.15	36.18	33.99	31.91	34.96	34.47
Honk Kong						16.1	13.9	9.4	16.5	18.4	19.0	19.2	25.83	32.08	32.92	30.73	29.55	
India	34.6	33.6	31.8	29.2	26.9	21.9	21.9	20.0	26.8	28.5	30.4	30.0	36.15	29.07	48.11	45.88	39.89	44.72
Indonesia	11.4	12.8	12.8	11.5	11.5	12.0	21.9	11.3	11.9	13.0	13.7	14.3	14.27	14.45	14.08	15.07	16.64	17.70
Italy	20.9	22.1	19.5	19.0	17.5	16.3	17.6	19.0	22.6	25.8	27.7	29.0	38.12	45.90	42.21	39.67	44.26	43.57
Netherlands	16.7	15.7	15.1	6.2	5.6	16.8	15.9	11.3	18.1	20.2	21.3	21.6	34.07	37.00	36.13	32.04	33.00	32.72
Portugal	24.1	22.6	20.1	20.3	14.1	19.4	20.1	21.1	23.5	26.3	26.5	26.4	30.05	39.15	43.57	31.58	34.73	33.00
Romania	14.5	15.3	13.5	12.4	11.4	10.0	10.6	11.9	14.6	15.6	16.7	18.3	22.13	24.71	23.28	21.64	24.88	24.97
Slovakia	9.4	10.4	13.4	12.0	12.1	11.5	12.0	13.4	17.19	24.4	35.2	17.7	25.59	32.69	30.23	28.66	33.55	32.78
Spain	21.6	20.9	19.1	18.9	44.5	44.8	44.7	10.9	51.4	72.3	53.7	64.4	40.33	20.30	18.90	11.90	17.95	28.43
Thailand	24.0	23.4	23.7	23.7	22.1	14.9	15.5	14.6	16.0	18.3	14.0	20.4	26.08	30.07	28.75	28.10	26.30	11.41
UK	23.3	24.0	25.1	19.4	22.8	20.9	19.6	24.7	28.6	35.4	33.4	34.6	38.73	42.13	35.08	36.33	22.40	17.97
USA						12.3	12.4	11.0	14.9	17.1	16.8	16.9	19.57	24.36	26.91	23.85	23.85	26.87
Viet Nam						14.8	14.6	15.2	17.5	19.8	19.6	20.1	27.74	35.54	35.54	30.50	27.77	
Top Exporters UV Mean	**21.5**	**21.3**	**19.4**	**18.3**	**17.5**	**19.2**	**19.7**	**16.4**	**21.9**	**25.4**	**24.8**	**27.9**	29.95	31.94	31.16	30.03	29.39	28.10

Source: UN Comtrade and author's computations